

apcmag

Australian Personal Computer

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FEATURES

Venture capital: For new business cash dial an angel
Ecommerce: Secure payments field guide
Silicon ceiling: Women in IT
Visiting the cybershrink: Sherry Turtle

FIRST TAKE

Visual Workstation 320:
SGI's new Intel-based NT box
Diamond HomeFree:
Painless wireless networking
Dell Celeron 400MHz desktop
Plus PII 366MHz and Celeron 300MHz notebooks
6x DVD-ROM drives
ISYS Spider
Dragon NaturallySpeaking

WORKSHOP

- Technobabble: Networking demystified
- Step by Step: Smoother printing
- Programming: New C++ column
- Windows 98: Start on steroids
- **Plus** OS/2 multimedia, Mac OS Sherlock, Linux graphics tools and shareware

On this month's software-packed CDs

- Security tools: 20 essentials to keep your data safe
- GameZone: Tomb Raider III: The Adventures of Lara Croft, European Air War, Lords of Magic: Special Edition, NBA Live 99, Thief: The Dark Project
- Linux updates: The latest Linux kernel, plus 20 other system updates
- The best of Linux: The top 80 programs

If your jam-packed CDs are missing, ask your newsagent!

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ISSN - 4115 NZ \$8.50 INCL. GST

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March 1999 \$7.95

& USB PDAs It's TIME

TIME TO BUY A HANDHELD COMPUTER:

They're portable, affordable, connected and finally ready for the mainstream

TIME TO CONNECT WITH USB:

USB devices offer better performance and make connecting a snap

apcmag.labs reviews

12 PDAs and handheld PCs

17 USB devices

12 DTP packages



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DELL DIMENSION® DESKTOPS – MULTIMEDIA SYSTEMS

COMMON FEATURES

- Mini Tower Chassis
- 3.5" 1.44MB Diskette Drive

- Microsoft® Windows® 98
- McAfee Virus Scan

- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

DELL DIMENSION® XPS R450 INTEL® PENTIUM® II PROCESSOR 450MHz

- 512KB Single Bank Pipeline Burst Cache
- 128MB 100MHz SDRAM
- 17.2GB Ultra ATA Hard Drive
- 16MB STB nVidia TNT 2X AGP Graphics Card
- Turtle Beach Montego II 320 Voice PCI Sound Card
- 4.8X DVD-ROM Drive and Decoder Card
- Altec Lansing ADA-880 Full Dolby® Digital Speakers with Subwoofer
- 19" Colour Monitor (17.9" v.i.s.)
- Logitech 4 button MouseMan® Wheel (PS/2v)
- 3Com® USR 56K Capable V.90 PCI WinModem
- Iomega Zip 100MB Internal Drive

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- 512KB Single Bank Pipeline Burst Cache
- 128MB 100MHz SDRAM
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- 16MB STB nVidia TNT 2X AGP Graphics Card
- Turtle Beach Montego A3D 64 Voice PCI Sound Card
- 4.8X DVD-ROM Drive and Decoder Card
- Harman Kardon HK195 Speakers
- 19" Colour Monitor (17.9" v.i.s.)
- Microsoft® IntelliMouse™
- 3Com® USR 56K Capable V.90 PCI WinModem

DELL DIMENSION® XPS R400 INTEL® PENTIUM® II PROCESSOR 400MHz

- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 12.9GB Ultra ATA Hard Drive
- 8MB STB nVidia 3D AGP Graphics Card
- Turtle Beach Montego A3D 64 Voice PCI Sound Card
- 40X Variable EIDE CD-ROM Drive
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™

DELL DIMENSION® V400 INTEL® PENTIUM® II PROCESSOR 400MHz

- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- ATI® 8MB 3D 2X AGP Integrated Graphics
- Yamaha 64 Voice Wavetable Integrated Sound
- Harman Kardon HK195 Speakers
- 32X Variable EIDE CD-ROM Drive
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- 3Com® USR 56K Capable V.90 PCI WinModem

\$5,199*
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or \$44 per week**

Upgrade options include:

- 256MB 100MHz SDRAM \$389
- 21" Trinitron® Monitor (19.8" v.i.s.) \$1,001
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\$4,269*
plus delivery

or \$36 per week**

Upgrade options include:

- Iomega Zip 100MB Internal Drive \$146
- 14.4GB Hard Drive (7,200 rpm) \$272
- Call for a complete range of upgrades

\$2,789*
plus delivery

or \$24 per week**

Upgrade options include:

- 128MB 100MHz SDRAM \$194
- 19" Colour Monitor (17.9" v.i.s.) \$360
- Call for a complete range of upgrades

\$2,689*
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Upgrade options include:

- 128MB 100MHz SDRAM \$194
- Iomega Zip 100MB Internal Drive \$146
- Call for a complete range of upgrades

DELL® INSPIRON® FULLY FEATURED NOTEBOOKS

COMMON FEATURES

- Integrated 256KB L2 Cache
- 3.5" 1.44MB Diskette Drive

- Microsoft® Windows® 98
- 1 Year Limited Warranty

- Free Lifetime Telephone Technical Support

NEW DELL® INSPIRON® 7000 A366GT NEW INTEL® PENTIUM® II PROCESSOR 366MHz

- 128MB SDRAM
- 10GB Ultra ATA Hard Drive
- 8MB ATI® RAGE LT PRO 2X AGP Video Controller
- High-fidelity Audio SoundBlaster Compatible
- 2X DVD-ROM Drive and Decoding
- 14.1" XGA Colour TFT Display
- 56K Modem
- Iomega Zip 100MB Internal Drive
- Deluxe Carrying Case

NEW DELL® INSPIRON® 7000 A333LT NEW INTEL® PENTIUM® II PROCESSOR 333MHz

- 64MB SDRAM
- 8GB Ultra ATA Hard Drive
- 8MB ATI® RAGE LT PRO 2X AGP Video Controller
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 15" XGA Colour TFT Display
- 56K Modem
- Deluxe Carrying Case

NEW DELL® INSPIRON® 7000 A333GT NEW INTEL® PENTIUM® II PROCESSOR 333MHz

- 64MB SDRAM
- 6.4GB Ultra ATA Hard Drive
- 8MB ATI® RAGE LT PRO 2X AGP Video Controller
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display
- 56K Modem

NEW DELL® INSPIRON® 7000 A333G NEW INTEL® PENTIUM® II PROCESSOR 333MHz

- 64MB SDRAM
- 4GB Ultra ATA Hard Drive
- 8MB ATI® RAGE LT PRO 2X AGP Video Controller
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display

\$7,429*
plus delivery

or \$63 per week**

Upgrade options include:

- 192MB SDRAM \$233
- Port Replicator \$311
- Call for a complete range of upgrades

\$6,439*
plus delivery

or \$54 per week**

Upgrade options include:

- 8GB Ultra ATA Hard Drive \$389
- 2X DVD-ROM Drive and Decoding \$331
- Call for a complete range of upgrades

\$5,249*
plus delivery

or \$44 per week**

Upgrade options include:

- 128MB SDRAM \$233
- Second Battery \$233
- Call for a complete range of upgrades

\$4,829*
plus delivery

or \$41 per week**

Upgrade options include:

- 6.4GB Ultra ATA Hard Drive \$194
- 2X DVD-ROM Drive and Decoding \$331
- Call for a complete range of upgrades

DELL® INSPIRON® – MAXIMUM MOBILITY NOTEBOOKS

COMMON FEATURES

- Integrated 256KB L2 Cache
- 3.5" 1.44MB Diskette Drive

- Microsoft® Windows® 98
- 1 Year Limited Warranty
- Free Lifetime Telephone Technical Support

NEW DELL® INSPIRON® 3500 A366GT NEW INTEL® PENTIUM® II PROCESSOR 366MHz

- 128MB SDRAM
- 10GB Ultra ATA Hard Drive
- 256-bit Graphics Accelerator
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display
- 56K Modem
- Iomega Zip 100MB Internal Drive
- Deluxe Carrying Case
- Second Battery

NEW DELL® INSPIRON® 3500 A333GT NEW INTEL® PENTIUM® II PROCESSOR 333MHz

- 32MB SDRAM
- 4GB Ultra ATA Hard Drive
- 256-bit Graphics Accelerator
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display
- Deluxe Carrying Case

\$7,169*
plus delivery

or \$60 per week**

Upgrade options include:

- 256MB SDRAM \$1,672
- Port Replicator \$311
- Call for a complete range of upgrades

\$4,539*
plus delivery

or \$38 per week**

Upgrade options include:

- 128MB SDRAM \$350
- 6.4GB Ultra ATA Hard Drive \$194
- Call for a complete range of upgrades

DELL PRECISION® WORKSTATION

COMMON FEATURES

- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 3.5" 1.44MB Diskette Drive
- Integrated 3Com® Fast Ethernet XL
- Integrated Ultra2/Wide and Ultra Wide SCSI Controllers

- Integrated Dual ATA-33 EIDE Controller
- Integrated SoundBlaster Pro Compatible
- 32X Variable SCSI CD-ROM Drive
- Dell® Mouse
- Microsoft® Windows NT® 4.0

2D/3D GRAPHICS SYSTEM DELL PRECISION® WORKSTATION 410 INTEL® PENTIUM® II PROCESSOR 450MHz (DUAL PROCESSOR CAPABLE)

- 64MB 100MHz SDRAM with ECC
- 6.4GB Ultra ATA Hard Drive
- Diamond Permedia 2 8MB 3D 2X AGP Video Card
- 17" Colour Monitor (15.9" v.i.s.)
- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

ADVANCED PERFORMANCE GRAPHICS SYSTEM

DELL PRECISION® WORKSTATION 610 INTEL® PENTIUM® II XEON® PROCESSOR 450MHz (DUAL PROCESSOR CAPABLE)

- 256MB 100MHz SDRAM with ECC
- 18GB LVD SCSI Hard Drive
- Evans & Sutherland Accel Galaxy 31 Graphics Card
- 21" Trinitron® Monitor (19.8" v.i.s.)
- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

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plus delivery

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or \$100 per week**

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- Intel® 440BX AGPset
- 128KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- ATI® 8MB 3D 2X AGP Integrated Graphics
- Yamaha 64 Voice Wavetable Integrated Sound
- 32X Variable EIDE CD-ROM Drive
- Harman Kardon HK195 Speakers
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- 3Com® USR 56K Capable V.90 PCI WinModem

\$2,359* plus delivery

or \$20 per week**

Upgrade options include:

- 128MB 100MHz SDRAM \$194
- Altec Lansing ACS-495 Full Dolby® Surround Sound Speakers with Subwoofer \$169
- Call for a complete range of upgrades

DELL DIMENSION® V333c INTEL® CELERON™ PROCESSOR 333MHZ

- Intel® 440BX AGPset
- 128KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- ATI® 8MB 3D 2X AGP Integrated Graphics
- Yamaha 64 Voice Wavetable Integrated Sound
- 32X Variable EIDE CD-ROM Drive
- Harman Kardon HK195 Speakers
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- 3Com® USR 56K Capable V.90 PCI WinModem

\$2,289* plus delivery

or \$19 per week**

Upgrade options include:

- 128MB 100MHz SDRAM \$194
- Altec Lansing ACS-495 Full Dolby® Surround Sound Speakers with Subwoofer \$169
- Call for a complete range of upgrades

DELL® POWEREDGE® SERVERS

DELL® POWEREDGE® 2300 SERVER INTEL® PENTIUM® II PROCESSOR 450MHZ

- Rack-mount Capable Mini Tower (Midnight Grey)
- (Dual Processor Capable)
- 512KB Internal Cache
- 64MB 100MHz SDRAM With ECC (Upgradeable to 1GB)
- 4GB LVD SCSI Hard Drive
- 3.5" 1.44MB Diskette Drive
- Standard Intel® Pro 100+ NIC
- Integrated Ultra2/LVD and Ultra/Narrow SCSI Controllers
- 32X Variable SCSI CD-ROM Drive
- 15" Colour Monitor (13.7" v.i.s.)
- Standard Openview Network Node Manager S.E.
- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

DELL® POWEREDGE 1300 SERVER INTEL® PENTIUM® II PROCESSOR 450MHZ

(DUAL PROCESSOR CAPABLE)

- Mini Tower (Midnight Grey)
- 512KB Internal Cache
- 128MB 100MHz SDRAM With ECC (Upgradeable to 1GB)
- 4GB LVD SCSI Hard Drive
- 3.5" 1.44MB Diskette Drive
- Standard Intel® Pro 100+ NIC
- Integrated Ultra2/LVD SCSI Controller
- 32X Variable EIDE CD-ROM Drive
- Standard Openview Network Node Manager S.E.
- 3-Year Limited Warranty
- Free Lifetime Telephone Technical Support

\$5,719* plus delivery

or \$48 per week**

\$4,519* plus delivery

or \$38 per week**

DELL DIMENSION® DESKTOPS – SMALL BUSINESS SYSTEMS

COMMON FEATURES

- Mini Tower Chassis

- 3.5" 1.44MB Diskette Drive
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- Microsoft® Windows® 95
- McAfee Virus Scan

- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

DELL DIMENSION® V400 INTEL® PENTIUM® II PROCESSOR 400MHZ

- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- Integrated Intel® 10/100 PCI Ethernet Controller
- ATI® 8MB 3D 2X AGP Integrated Graphics
- 32X Variable EIDE CD-ROM Drive
- 15" Colour Monitor (13.7" v.i.s.)

\$2,499* plus delivery

or \$21 per week**

Upgrade options include:

- 17" Colour Monitor (15.9" v.i.s.) \$194
- 12.9GB Ultra ATA Hard Drive \$136
- Call for a complete range of upgrades

DELL DIMENSION® V350 INTEL® PENTIUM® II PROCESSOR 350MHZ

- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- Integrated Intel® 10/100 PCI Ethernet Controller
- ATI® 8MB 3D 2X AGP Integrated Graphics
- 32X Variable EIDE CD-ROM Drive
- 17" Colour Monitor (15.9" v.i.s.)

\$2,459* plus delivery

or \$21 per week**

Upgrade options include:

- 19" Colour Monitor (17.9" v.i.s.) \$360
- 3Com® USR 56K Capable V.90 PCI WinModem \$101
- Call for a complete range of upgrades

NEW DELL DIMENSION® V400c NEW INTEL® CELERON™ PROCESSOR 400MHZ

- Intel® 440BX AGPset
- 128KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- Integrated Intel® 10/100 PCI Ethernet Controller
- ATI® 8MB 3D 2X AGP Integrated Graphics
- 32X Variable EIDE CD-ROM Drive
- 15" Colour Monitor (13.7" v.i.s.)

\$2,199* plus delivery

or \$19 per week**

Upgrade options include:

- 17" Colour Monitor (15.9" v.i.s.) \$194
- Iomega Zip 100MB Internal Drive \$146
- Call for a complete range of upgrades

DELL DIMENSION® V333c INTEL® CELERON™ PROCESSOR 333MHZ

- Intel® 440BX AGPset
- 128KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- Integrated Intel® 10/100 PCI Ethernet Controller
- ATI® 8MB 3D 2X AGP Integrated Graphics
- 32X Variable EIDE CD-ROM Drive
- 15" Colour Monitor (13.7" v.i.s.)

\$2,029* plus delivery

or \$17 per week**

Upgrade options include:

- 17" Colour Monitor (15.9" v.i.s.) \$194
- Iomega Zip 100MB Internal Drive \$146
- Call for a complete range of upgrades



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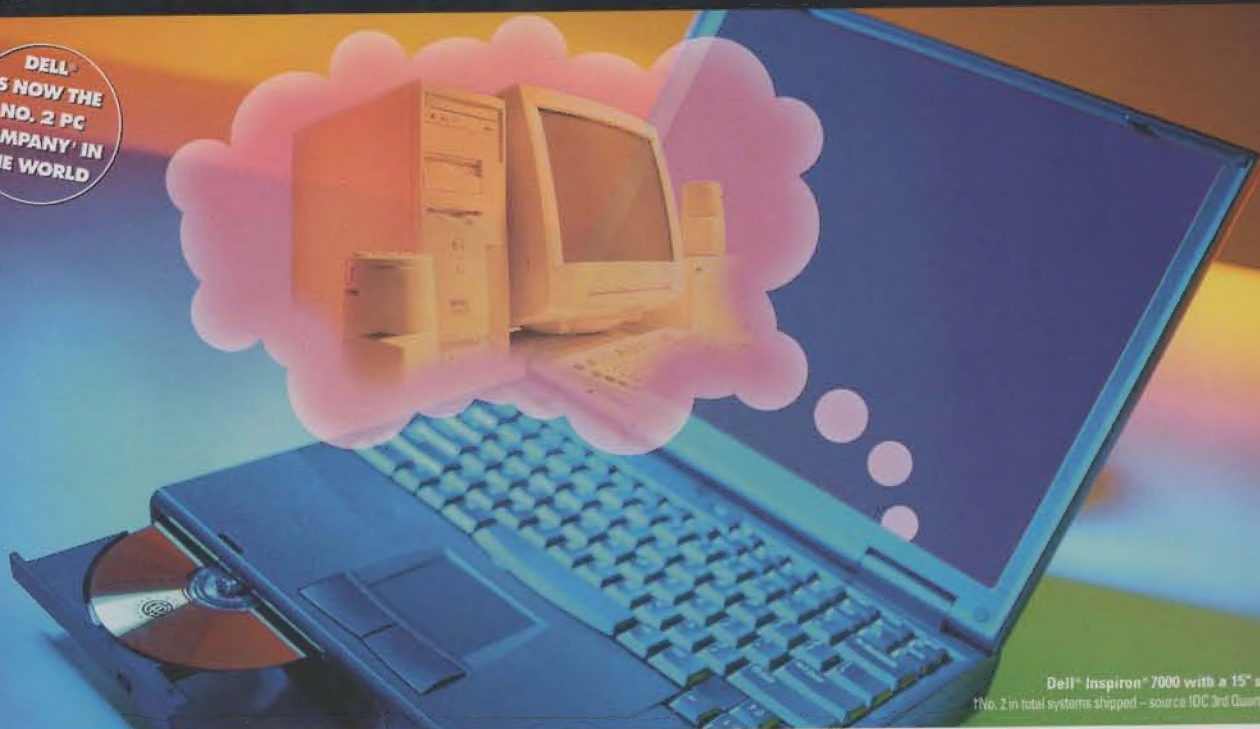
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DELL® INSPIRON® 366MHZ. SO FAST IT THINKS IT'S A DESKTOP.

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IS NOW THE
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COMPANY* IN
THE WORLD



Dell® Inspiron® 7000 with a 15" screen
*No. 2 in total systems shipped - source: IDC 3rd Quarter 1999.

With the option of an Intel® Pentium® II processor 300MHz, 333MHz or 366MHz, the Dell® Inspiron® 7000 is more like a desktop than a mobile notebook. And you'll probably think so too with options like a 15" image screen, huge 14GB Hard Drive, 192MB SDRAM, 8MB Video Controller and much more to enable dazzling multimedia performance. Also, don't forget, for extra mobility there's the Inspiron® 3500 series - heavy on performance and features, but light on price. To order, call 1300 303 107 or visit the Dell WebStore at www.dell.com.au

NEW DELL® INSPIRON® 7000 A366LT NEW INTEL® PENTIUM® II PROCESSOR 366MHz

- Integrated 256KB L2 Cache
- 128MB SDRAM
- 14GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- 8MB ATI® RAGE LT PRO 2X AGP Video Controller
- High-fidelity Audio SoundBlaster Compatible
- 2X DVD-ROM Drive and Decoding
- 15" XGA Colour TFT Display
- Microsoft® Windows® 98
- 56K Modem
- Iomega Zip 100MB Internal Drive
- Deluxe Carrying Case
- Second Battery
- 1 Year Limited Warranty
- Free Lifetime Telephone Technical Support

\$8,399* plus delivery

or \$71 per week**

Upgrade options include:

- 192MB SDRAM \$233
- Port Replicator \$311
- Call for a complete range of upgrades

NEW DELL® INSPIRON® 7000 A333GT NEW INTEL® PENTIUM® II PROCESSOR 333MHz

- Integrated 256KB L2 Cache
- 64MB SDRAM
- 6.4GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- 8MB ATI® RAGE LT PRO 2X AGP Video Controller
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display
- Microsoft® Windows® 98
- 56K Modem
- 1 Year Limited Warranty
- Free Lifetime Telephone Technical Support

\$5,249* plus delivery

or \$44 per week**

Upgrade options include:

- 128MB SDRAM \$233
- Second Battery \$233
- Call for a complete range of upgrades

NEW DELL® INSPIRON® 3500 C300GT NEW INTEL® CELERON® PROCESSOR 300MHz

- Integrated 128KB L2 Cache
- 32MB SDRAM
- 3.2GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- 256-bit Graphics Accelerator
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display
- Microsoft® Windows® 98
- 1 Year Limited Warranty
- Free Lifetime Telephone Technical Support

\$3,759* plus delivery

or \$32 per week**

Upgrade options include:

- 64MB SDRAM \$117
- 4GB Ultra ATA Hard Drive \$58
- Call for a complete range of upgrades



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Visit our 24 hour WebStore
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IS NOW THE
NO. 2 PC
COMPANY* IN
THE WORLD

Dell Dimension® XPS R Series

*No. 2 in total systems shipped -- source IDC 3rd Quarter 1998

DELL DIMENSION® XPS R450 INTEL® PENTIUM® II PROCESSOR 450MHz

- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 128MB 100MHz SDRAM
- 14.4GB Ultra ATA Hard Drive (7,200rpm)
- 3.5" 1.44MB Diskette Drive
- 16MB STB nVidia TNT 2X AGP Graphics Card
- Turtle Beach Montego II 320 Voice PCI Sound Card
- 4.8X DVD-ROM Drive and Decoder Card
- Altec Lansing ADA-880 Full Dolby® Digital Speakers with Subwoofer
- 19" Colour Monitor (17.9" v.i.s.)
- Logitech 4 button MouseMan® Wheel (PS/2v)
- Microsoft® Windows® 98
- McAfee Virus Scan
- 3Com® USR 56K Capable V.90 PCI WinModem
- Iomega Zip 100MB Internal Drive
- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

DELL DIMENSION® XPS R450 INTEL® PENTIUM® II PROCESSOR 450MHz

- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 12.9GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- 16MB STB nVidia TNT 2X AGP Graphics Card
- Turtle Beach Montego A3D 64 Voice PCI Sound Card
- 40X Variable EIDE CD-ROM Drive
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- McAfee Virus Scan
- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

DELL DIMENSION® XPS R400 INTEL® PENTIUM® II PROCESSOR 400MHz

- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 12.9GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- 8MB STB nVidia 3D AGP Graphics Card
- Turtle Beach Montego A3D 64 Voice PCI Sound Card
- 40X Variable EIDE CD-ROM Drive
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- McAfee Virus Scan
- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

CHOOSE AWESOME OPTIONS UP TO:

- 16MB Graphics Card
- 4.8X DVD-ROM
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- Dolby® Surround Sound speakers with Subwoofer

The Dell Dimension® XPS R series offers powerhouse performance with great value. These hard workers consistently come up with the goods with features like the Intel® Pentium® II processor 450MHz, 17.2GB hard drive and a 384MB SDRAM upgrade available. Then of course there's the high performance multimedia options like the 16MB graphics card, 4.8X DVD-ROM and 80W Dolby® Digital Speakers. Could it be the ultimate sensory experience? To find out, call 1300 303 107 or visit the Dell WebStore at www.dell.com.au

\$5,159* plus delivery

or \$43 per week**

Upgrade options include:

- 256MB 100MHz SDRAM \$389
- 21" Trinitron® Monitor (19.8" v.i.s.) \$1,001
- Call for a complete range of upgrades

\$3,289* plus delivery

or \$28 per week**

Upgrade options include:

- 14.4GB Ultra ATA Hard Drive (7,200rpm) \$272
- 3Com® USR 56K Capable V.90 PCI WinModem \$101
- Call for a complete range of upgrades

\$2,789* plus delivery

or \$24 per week**

Upgrade options include:

- 128MB 100MHz SDRAM \$194
- 19" Colour Monitor (17.9" v.i.s.) \$360
- Call for a complete range of upgrades



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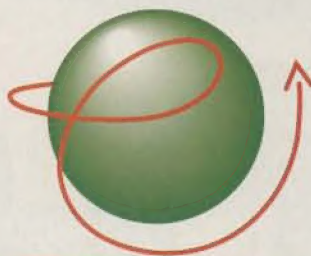
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access¹

Network Printing with a HP breaks the rules for network printing

The new HP LaserJet 8100 network printer adds an entirely new dimension in personal service. Designed to handle the demands of departmental printing applications, the HP LaserJet 8100 has the same high speed and performance of HP's range of network printers. What sets it apart, is the range of innovative features that give users the privacy, convenience and ease-of-use of a personal printer.

Hear it from our Customers.

"Without the HP LaserJet 8100's Proof and Hold feature, I would have misspelled the client's name on all 20 copies of the presentation!"

— Account Executive

"With Private Printing, I don't have to run to the printer or wait till everyone goes home before I print out confidential performance appraisals!"

— HR Manager

"I'd finished distributing the proposal when I realised I needed more copies. So I simply went back to our HP LaserJet 8100 and used the Quick Copies feature to print out a few more — without having to go back to my desk at the other end of the office."

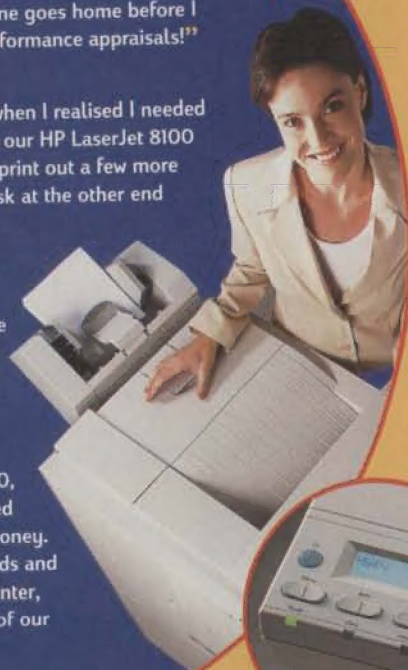
— Secretary

"The HP LaserJet 8100's Job Interrupt feature put me right at the front of the print queue so I could print an urgent contract from my notebook to close an important deal."

— Sales Executive

"Since we bought the HP LaserJet 8100, the Walk-up Printing feature has saved us a lot of time, storage space and money. Now that everyone gets the letterheads and forms they need straight from the printer, we don't have to keep excess stocks of our company stationery any more."

— Office Manager



To make high-volume printing easier, the HP LaserJet 8100 delivers a host of new features that help personalise technology in a world where network printing is becoming commonplace. All these features can be activated from the control panel at the touch of a button.

Proof and Hold.

For anyone who has ever printed multiple copies of a document only to have to print them again because of a minor error, this will prove to be invaluable. Proof and Hold allows you to print just one copy of a large print job for a final proofread. You can then choose to continue printing, delete the job or even change the number of copies required at the printer.

Walk-up printing.

The HP LaserJet 8100 allows frequently used form of commonly printed documents to be stored on an internal disk. Users can then select and print the copies they need directly from the printer's control panel.

Quick Copies

What do you do if you've just printed multiple copies of a document and then realised you needed more? Quick Copies lets you make up to 999 copies of a print job that has already been completed without having to walk back to your computer. Simply select the job and the number of copies required and print.

Private Printing

Ever wished that you could get a confidential document to print only when you are at the printer? With Private Printing, the printer holds your job and prints it only when you enter your PIN at the printer's control panel. Now you can send your documents to print and retrieve them at your leisure.



HP Mopier 320



Colour Network Printers
HP 2500CM
HP Colour LaserJet 4500
HP Colour LaserJet 8500



Departmental
Network Printers
HP LaserJet 8000
HP LaserJet 8100 **NEW**



Workgroup Network Printers
HP LaserJet 2100 **NEW**
HP LaserJet 4000
HP LaserJet 5000

Personal Touch.

with the new HP LaserJet 8100.

Job Interrupt

Tired of having to wait to print an urgent document because of a long print queue? Job Interrupt uses Fast Infrared (FIR) technology to enable walk-up printing from a portable PC, palmtop or other infrared devices without cables. This feature helps you speed things up by placing your infrared jobs at the front of the print queue.

The HP LaserJet 8100 prints at 32 pages per minute and has a high duty cycle of 150,000 pages per month. With 16Mb RAM, a 166MHz RISC processor, Transmit-Once and Dynamic RIP-Once on board, it is no wonder that processing speed is faster and network traffic reduced.

HP has also taken into account the cost of ownership. The HP LaserJet 8100 comes with an HP Toner Gauge for tracking toner usage, while the high capacity toner gives a lower cost-per-page which results in substantial cost savings in the long run.

With all its innovative features and performance, the HP LaserJet 8100 network printer looks set to revolutionise network printing.

HP changes the face of network printing.

HP is the leader in network printing solutions, with more than 66 per cent* market share in network printing in Asia-Pacific.

Dedicated to bringing you the latest in network printing technologies, HP has a full suite of network printing solutions aimed at giving business lower total cost of ownership. These solutions also provide functionality and ease-of-use features to make network users and administrators more productive.

This commitment is clearly demonstrated by the latest HP LaserJet 8100 network printer with its breakthrough technologies and innovative features as well as the accolades we've received from some of our customers.

"HP's Network Printing Solutions have significantly reduced our total cost of ownership."

— David Warner, Chief Information Officer, Flight Centre, Australia

"HP's Network Printing Solutions are so easy to configure and use — it's like plugging in an electrical appliance and switching it on."

— C.R. Narayanan, Sr. Manager (Information Systems), ASEA BROWN BOVERI, India



HP LaserJet 8100 printer with optional accessories for expanded capabilities.



HP LaserJet 8100 Network Printer



5-Bin Mailbox with stapler/
8-Bin Mailbox



2000-Sheet
Input tray



Duplexer



Envelope
Feeder

No wonder HP has over 66%* market share in network printing.

*IDC and Dataquest report on 11 pages and above/minute monochrome laser printer market share in Asia-Pacific (12 countries excluding Japan), Nov '97 to April '98. Source: IDC Asia-Pacific Print Server Semi-Annual Study (January to June 1998) shows HP has 66% market share in the category.



HP JetDirect Print Servers



HP Web JetAdmin
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As well as unique content, AOL has thousands of chat rooms with subjects ranging from sport to finance, to the more unusual subjects such as pet chat. If you still can't find an appropriate chat room, you can invite your online buddies to your own chat room using the Buddy List facility.

AOL LIVE lets you go to online auditoriums both in the Australian service and on International services with guest speaker celebrities such as Jewel, Natalie Imbruglia, Kate Ceberano, Michael Jackson and Alicia Silverstone just to name a few.

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KEYWORD: AOL TOUR



AOL's Entertainment channel lets you tap into the latest Hollywood gossip, movie reviews and keeps you in touch with the latest arts & entertainment.

KEYWORD: ENTERTAINMENT

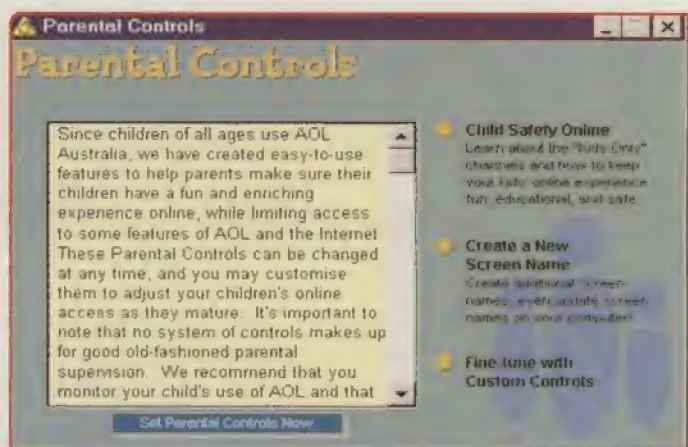


ADVERTORIAL



Explore Australia or the world - the choice is yours! Join the AOL community and see why over 14 million members subscribe to AOL worldwide. Just by clicking the International Channel you have access to our services and members worldwide!

KEYWORD: INTERNATIONAL



AOL lets you rest easy with Parental Controls for your family's added security. Worried about what your kids might be able to access? Rest assured this will be completely within your control on AOL. Set your own limits for which AOL and Internet areas your kids have access to - you can block various types of access to the Net, such as downloads from Newsgroups, Chat rooms, or you can block all Internet access, so that kids can play safely. All kid's Chat areas are also chaperoned by AOL 'guides'.

KEYWORD: PARENTAL CONTROLS

Install your **FREE trial software today!**

*Your free trial must be used within one calendar month of your initial sign-on. Free trial does not include telecommunication charges. The pricing plan is outlined online. Access to AOL requires a credit card and is subject to AOL credit approval. To use AOL you must have a 486 PC or higher, 16MB of RAM, 25MB of HD, a VGA monitor (256 colour support recommended), a mouse, a modem, a CD ROM and a copy of Windows 95 or 98. You must be 18 years or older. Limit of one free trial per household. Offer only available in Australia. Free trial must be used by 31/12/99. Access to and usage of AOL is subject to terms and conditions, which are available, online.

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R0LDP00016



Hardware wants to be free

The wired world takes another bizarre twist as companies find new ways of making us pay.

By Jeremy White

It's strange when you start feeling nostalgic about the early days of the Web. Lost back in the halcyon haze of an era when NSCA Mosaic ruled the Web and the green gecko was the geek motif of choice for Marc Andreessen and the Netscape crowd. Back when *Wired* was cool. When only a sub-percentile elite had any clue what the Internet was, and you could read a computer magazine without even seeing the word. Back when folks genuinely believed this was the Wired Generation, and the chaotic democracy of the Web was going to free the world from poverty, greed and the worst excesses of commerce. Back when the Electronic Frontier Foundation gave electrons a conscience, and when three in five screensavers proclaimed 'Information wants to be free'.

Information wants to be free. People have stopped saying the phrase now. It's gone from the secret chant of the elite, to glib catchcry in Web development shops, to fodder for newspaper and magazine writers, and has ended up a dowdy encapsulation of a bygone era of naivety and HTML-eyed optimism.

As Net stocks bubble to new records in hot-aired puffs of irrationality, and Net pioneers like Yahoo reach market capitalisations the size of Third World economies, the phrase takes on a surreal quality.

But while the words have a newly hackneyed echo, the concepts live on and have matured. Now software wants to be free. The same fundamental values that drove the early Web are now driving Linux and the entire open source software movement. Democratic values, a passionate belief in changing the world, altruism, a vein of anti-commercialism and the desire to advance the common good are all there, and all hard to argue with.

There is a clear shift coming in the application of these concepts, however. In

the same way that 'information wants to be free' has seen information providers priced at \$327 a share or \$100 per user, a commercial boom is coming on the back of open source software as companies like IBM and Oracle get behind it. Maybe Red Hat and Caldera are the next Yahoo and Amazon.com. Microsoft's even trying to convince a US court of it.

Now hardware wants to be free. A company in the US called Free-PC.com has announced plans to give away low-end PCs (worth sub-\$US1,000) manufactured by Compaq, and they're going to throw in Internet access for free too. Sounds like a good deal. The catch? They want your soul.

Ironically, information being free on the Web now means 'information wants to be paid for by advertisers'.

To qualify for a free PC, you'll need to provide detailed demographic information and agree to a side panel of advertising running over everything you do, and to use the service for at least a minimum number of hours each month. Free-PC.com will then use the detailed demographic information to provide highly detailed customisation and reporting to its advertisers.

The business plan, such as it is, is based on research figures in the US that the ongoing advertising value of each Internet user is about \$1,000, a figure which is set to double and quadruple over the next year and the year after.

This is not that different, of course, from the concept driving those \$1 or free mobile phone offers. You sucker in a user with an apparently free piece of hardware, but really amortise the cost of the hardware in higher ongoing usage charges, or rely on making a profit from the high-

margin provision of telecommunications services and write off the upfront cost.

There are several cable TV companies and regional Bell telephone companies in the US that are seriously considering giving away if not PCs then at least cable modems to get users online and paying ongoing monthly charges. From their viewpoint, rather than selling a single product, they're buying a long-term revenue stream and customer relationship.

Ironically, information being free on the Web now means 'information wants to be paid for by advertisers'. Most Web sites have no subscription revenue — just advertising revenue.

On a similar theme, popular US columnist James Cramer (from *TheStreet.com*) has predicted that online trading will be free before long, and that instead of brokerages making their money from providing advice and executing the transactions, they will make a living from providing finance and holding assets. And, it almost goes without saying, from advertising on their sites by other financial services companies.

All this rampant indirection strikes me as bizarre. We're getting further and further away from paying directly for the service or product we're using as consumers, and are ending up paying indirectly instead. As a result we're paying more money over a longer term in an unidentifiable form.

Ultimately, even if you order it online, everyone knows that there's no such thing as a www.free-lunch.com. Not yet, anyway — although of course the domain has been registered. ■

NEWSWIRE

21

Kinda from down under	21
How to beat the notebook thief	21
News Roundup	24
ACCC slams Telstra price proposal	24
IT spending an eye opener	24
Overclockers rush to Celeron 300A	26
Call centres: Tech sweatshops?	26
Call for biotech funding	28
Apple of many colours	28
Hidden report reveals crypto paranoia	30

NEWS ANALYSIS

The Linux identity crises	32
Tech legislation on the table	35

FORUM

52

EDITORIAL	8
-----------	---

READERS' SAY	52
--------------	----

TWO BITS WORTH

Helen Dancer	
In a Barbie world	54
Jeremy Horey	
Riding out the learning curve	56
Jeremy Torr	
The fall of the Roman Empire	58
Cathie Kennedy	
Preserving core competencies	59

PRICE WATCH

Colour inkjets	63
----------------	----

SERVICE & RELIABILITY

Not on my account	64
-------------------	----



FAMILY

Technology in the classroom	65
-----------------------------	----

BOURSEWARE

Second-wave evolutionaries	66
----------------------------	----

LEGAL EASE

Making copyright right	68
------------------------	----

CORPORATE

Cost cutting	69
--------------	----



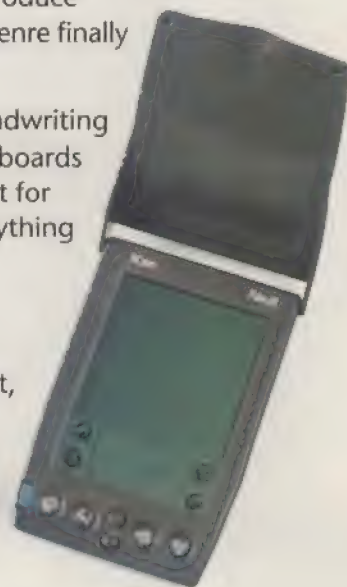
Handheld computing

Handhelds — or palm/pocket computing devices, or PDAs (personal digital assistants), call them what you will — have matured a great deal in recent months. Vendors that have struggled for years to produce acceptable pricing, form and functionality for the genre finally appear to be getting it right.

In the past such machines have had immature handwriting recognition, they've been too expensive, their keyboards have been too small and silly, they've been difficult for anyone but geeks to use, or they just didn't do anything useful. Not any more.

This month we review 12 'palm' and 'clamshell' handheld devices that are based on a variety of operating systems and vary greatly in terms of cost, suitability and comparative effectiveness. This means there's something here for almost anyone who's thinking about buying one of these little beauties.

103



PROFILE

76

VISIT TO THE CYBER SHRINK

Dan Tebbutt reclines on the couch of Sherry Turkle, an American academic renowned as the Internet's leading psychologist.

76

FEATURE

78

THE IT INDUSTRY IS FULL OF MEN. SO WHAT?

Research suggests women are overlooking IT careers, but does the industry need them?

78

By Selina Mitchell

ALP Senator Kate Lundy, shadow minister assisting on IT

80

Sandie Downey, Skills.net Roadshow coordinator

81

Many Cramer, manager of Electronic Business, Department of Defence

82

Tania Edwards, senior database administrator

84

ANGEL AT THE DEALING TABLE

The venture capital market has matured and a new niche is opening up: one-off business angels.

89

By David Forman

Multiplication (that's the name of the game)

92

By Helen Dancer

SOFTWARE

121

THE LOWDOWN ON LAYOUT

Desktop publishing is becoming ubiquitous. We check out 11 consumer and professional packages.

121

By Stephen Withers

Editor's Choice

123

PROFESSIONAL PACKAGES

Adobe PageMaker 6.5 122

Corel Ventura Publisher 8 122

QuarkXPress Passport 4.04 123

CONSUMER PACKAGES

Brøderbund Print Shop Deluxe 6.0 124

Corel Print House Magic Deluxe 124

Corel Print Office 124

Expert Software Personal Publisher 126

IMSI MasterClips Publisher 126

Microsoft Home Publishing 99 126

Mindscape PrintMaster Platinum 7.0 130

Sierra Print Artist Platinum 130

TECHNICAL

95

READY, SET, STOP

Secure payment mechanisms are fundamental to ecommerce. What's taking so long?

95

By Dan Tebbutt

A SET menu: How online payments work

100

Secure your server

101

Beef up your browser

102

HARDWARE

103

POWER IN YOUR HAND

A look at the latest releases from the world of connected palm, pocket and handheld computers.

103

By Jeremy Torr

Editor's Choice

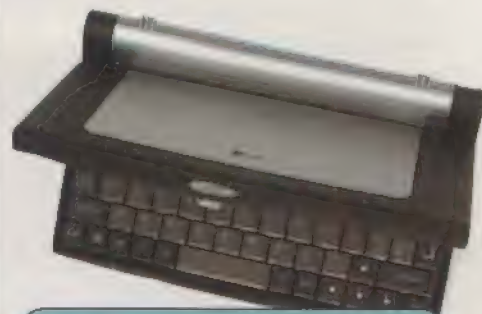
104

How we tested

105

Specifications

112



3Com Palm III	104
Casio Cassiopeia E-11	104
Compaq 2010c	105
Ericsson MC 16	105
Everex Freestyle	107
Hewlett-Packard Jornada 820	107
LG Phenom Express	108
Philips Nino 300	108
Philips Velo 500	112
Psion Series 5	113
Royal daVinci	114
Sharp PV-5000A	114

HARDWARE

115

TO USB OR NOT USB?

If it had a Universal Serial Bus plug on the end of the cable, APC reviewed it.

115

By Josh Mehlman

How we tested

116

CAMERAS

Kodak DC260 116

Kodak DVC323 116

Logitech QuickCam Home 116

Philips PCA645VC 117

INPUT DEVICES

Logitech WingMan Formula Force USB 117

Logitech USB Wheel Mouse 117

Microsoft Natural Keyboard Elite 117

Microsoft SideWinder Freestyle Pro 118

Saitek Cyborg 3D Stick 118

MODEMS AND NETWORKING DEVICES

Netcomm Roadster II 56 USB modem 118

Epson Stylus Color 740 119

Agfa Snapscan 1212u 119

SPEAKERS

Altec Lansing ADA305 Digital PowerCube Speaker System 119

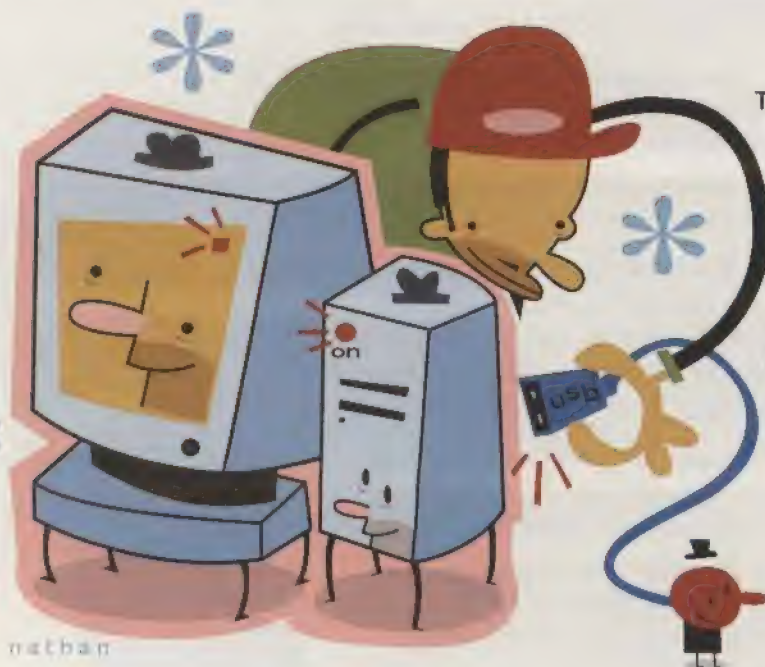
Altec Lansing ADA70 Digital PowerCube Speaker System 119

Philips DSS370 speakers 120

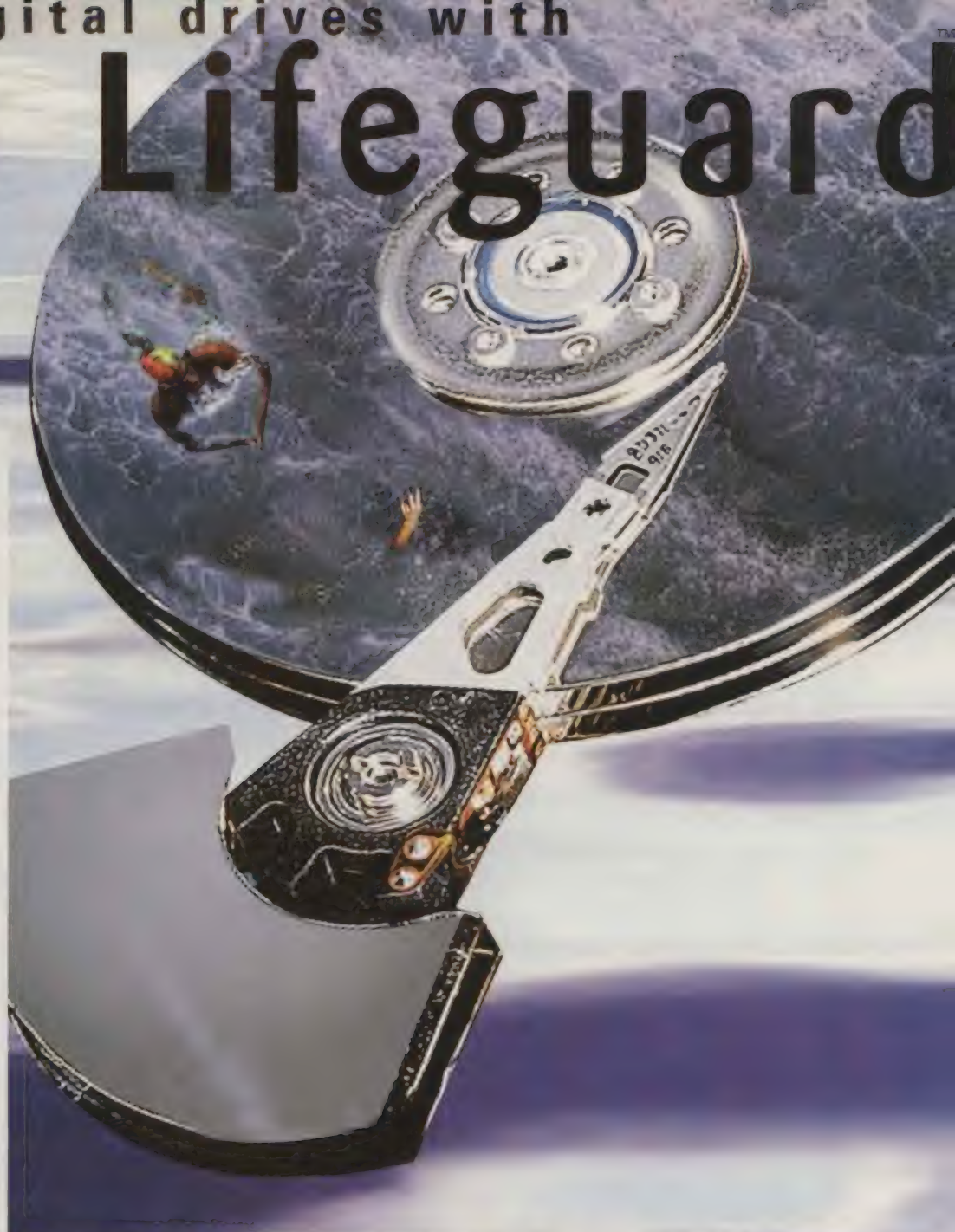
DISK DRIVES

Imation SuperDisk Drive 120

Iomega USB Zip 100 120



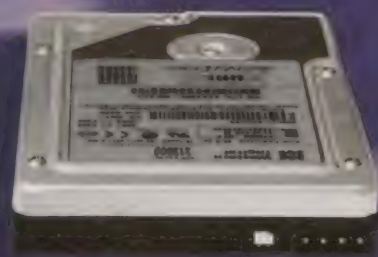
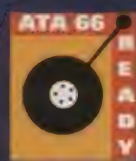
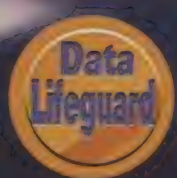
Western Digital drives with Data Lifeguard



The Data Lifeguard feature is in every Western Digital hard drive. Data Lifeguard protects end user data by automatically detecting, isolating and repairing possible problem areas before data loss can occur. This new feature is always enabled and works independently preventing possible system down time by warning the user of the impending risk of Hard Drive failure. This represents Western Digital's ongoing commitment to data protection.

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Western
Digital

FIRST TAKE

36

SGI VISUAL WORKSTATION 320

A state-of-the-art x86 machine ideal for moving to NT. 36



CYBERNET PC TV

A large-screen TV in search of an application. 38

DELL INSPIRON PENTIUM II AND CELERON 300MHZ NOTEBOOKS

Two Dell notebooks featuring Intel's latest mobile processors. 40

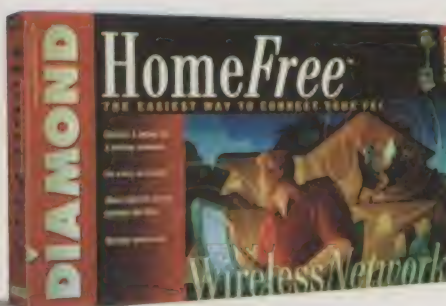


DRAGON NATURALLYSPEAKING PREFERRED

Voice recognition is not flawless but it is improving. 42

DIAMOND HOMEFREE

Painless wireless networking for the home. 44



DELL DIMENSION V400C

A 400MHz desktop system. 46

AOPEN DVD-9632 AND PIONEER DVD-A03S

Third-generation DVD-ROM technology has arrived. 46

DRUMBEAT 2000

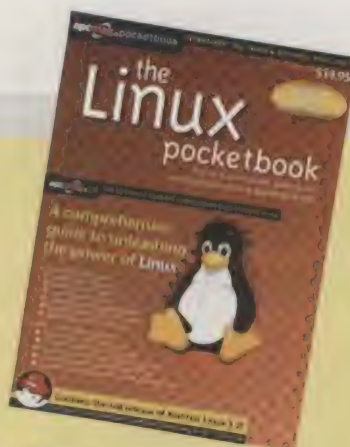
Database application creation for the Web. 48

ISYS SPIDER 1.5

An add-on to the ISYS indexing engine. 50

AVISION SCAN COPIER DS300

Cheap photocopies and good scans. 50



The Linux Pocketbook

On sale NOW at newsagencies everywhere. Comes with Red Hat Linux 5.2 on the cover CD!

AFTER HOURS

187

BIBLIOFILE

Connection is key in this month's selection of IT titles 187
Off the Shelf 188
Perspective: The final frontier? 190



INTERACTIVE

National Geographic and Blinky Bill hit the stands on CD-ROM 191
Interactive News 192

GAMEZONE

Lara does Antartica 193
Games News 196

WEB FILE

50,000 light years from home 197
Surfbaud: From Earth to the Moon 198

CHIP CHAT

The spirit of stupidity, spray and wipe, and other tales. 200
Contest: Technology Gag of the Month 200

ADVERTISERS' INDEX

20

CD CONTENTS

14

WEB CONTENTS

16

CREDITS

18

CD INFORMATION

185

CONTACT INFORMATION 18, 185

WORKSHOP

131

CONTENTS

Contest: Bug of the Month 131

TECH TALK

Technobabble: The machinery of networks 132
By Nathan Taylor
Step by Step: Printer maintenance 134
By Daniel Rutter

OPERATING SYSTEMS

Windows 98: Quick Launch and the Start menu 138
By Kieran McNamee
OS/2 Warp: Multimedia 140
By Christopher Relf

Mac OS: Sherlock 143
By Stephen Withers
Linux: XV, Gimp, Netpbm and XFIG 145
By Geoffrey Bennett

PROGRAMMING

Simple C++: The first instalment in our new series 148
By Michael Smith
Java: How Java can help with client/server systems 150
By David Williams

SHAREWARE

Shareware summary 152



Platinum Series

From
ridiculously
accurate
to just plain
brilliant.



Gold Series



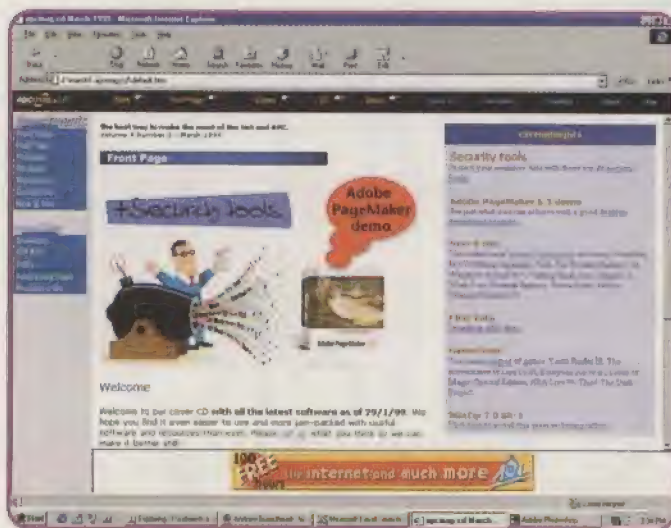
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This month on APC's cover CDs



DISC 1

SECURITY TOOLS

Autowipe, BigSecret, BlackBoard Netscape Privacy Interface, Bug Sprayer, Burn, Desktop Surveillance 98, Hook Protect, Investigator, I-SeeU,



Mouse Trap, NukeNabber, Outlines 98, PassGen Suite, Password Policy Enforcer (PPE), Passwords Plus, PC Activity Monitor (PC Acme), PC Security Guard (PC

Guard), RedHand Security Monitor, Swap File Overwriter, The Block

NEW & HOT

NookNak, My Wedding Organizer, Push The Freakin' Button 1.04, Windows Restart 98 7, Talking Email, Icon Digger 1.2, Work Pace, Hotmail Express, Virtual Drive, Media Changer Deluxe 4.03

WORKSHOP

Windows: Repligator 4.0, Tiera-Zon 2.7, Tyler 3.1, Ultimate Paint 1.9c, Xara WebStyle 1.2
Mac: Transit 1.1.1 PPC, LinkPad 1.0, Net-Print 8.1, PPPop 2.0.2 PPC, Sigerson 2.0
Linux: X-Chat, gifsicle, gRun, WMitime, XGlobe

Other Workshop files: XV, GIMP, XFIG, Java.zip, Hello.cpp, newswire.src.hqx, apcmag.src.hqx

GAMEZONE

Tomb Raider III: The Adventures of Lara Croft, European Air War, Lords of Magic: Special Edition, NBA Live 99, Thief: The Dark Project

FIRST TAKE

Drumbeat 2000

REVIEWS

PageMaker 6.5

BROWSERS

Microsoft IE 4.01 SP1, Microsoft IE 4.0, Microsoft IE 3.03, Microsoft IE 3.02, Netscape Communicator 4.5, Netscape Communicator 4.08, Netscape Navigator 4.08

DISC 2

LINUX UPDATES

Linux kernel 2.2.1, plus the latest versions of GNOME, KDE, Samba, binutils, Linux libc5 C Library, Linux libc6 C Library, Dynamic Linker (ld.so), Procps, Procinfo, Psmisc, Net-tools, Loadlin, Sh-utils, Autofs, NFS, Bash, Ncpfs, Pcmcia-cs, PPP, Util-linux



THE BEST OF LINUX

BitchX 75p1, Afterstep 1.6.6, AfterstepControlPanel 0.9.4, BMRT 2.4 beta, CDParanoia alpha release 9.4, CDRecord 1.6.1, EPIC 3.004, EzPPP 1.0, GNOMEghostscriptviewer 0.26, GNU Plot 3.7, Linuxconf 1.13r12, Mod_Perl 1.17, MSWordView 0.5.2, NEdit 5.0.2, PentiumGCC 1.1.1, qmail 1.03, Sox 12.15, Wine 990110, WMFinder 0.3, WMLoad 0.9.2, WMMail 0.6.2, WMNet 1.05, WM Rack 1.0, WMTIME 1.0, WSoundPrefs 0.9.1, x11amp 0.7, xMySQL 1.10, XSnow 1.40, Zircon 1.18, plus more...

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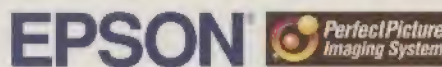
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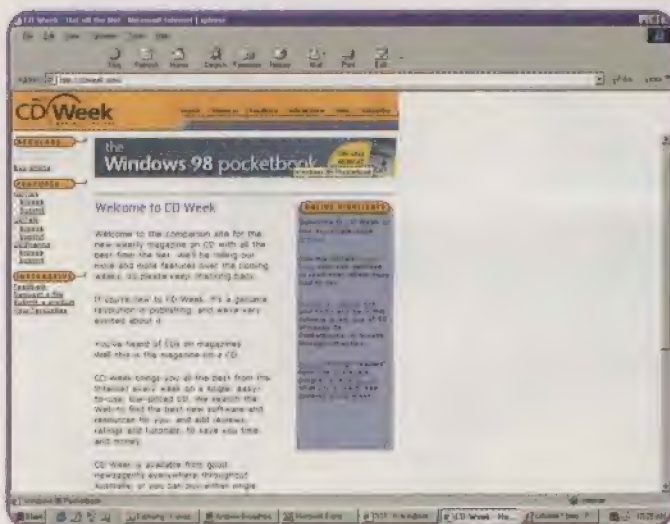
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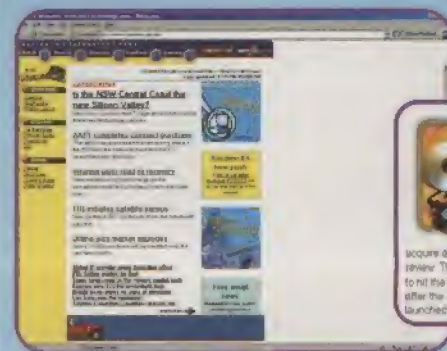
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This has not endeared the column to some of our readers, who have accused us of being cynical, lacking in inventiveness and acting as a spy for multinational recording companies. So, in the spirit of at least attempting to grab hold of the revolution, we decided to acquire a **Colson Multimedia Rio** portable MP3 player for review. The Rio is not, of course, the only portable MP3 player to hit the market, but it quickly became the most controversial after the Recording Industry Association of America (RIAA) launched a failed attempt to have the device banned.

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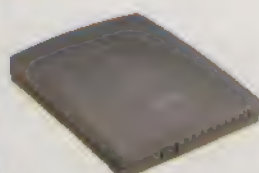
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Advertising index

AES	147, 186	Hallmark	135	Panasonic	49	PC SUPERMARKET	
AGC	62	Hearne	137	Servex	19, 41, 88	Beam	166
American Power	97	Hewlett-Packard	4, 5, 31, 91	Silicon Graphics	17	City Software	160, 161
AOL	6, 7	Macase	37	Sony	13	Corporate Software	170, 171
Apple	83, 85	Magtron	67	Soyo	87	CX Computers	174
ASP	93	Micrografix	106	The Internet Group	60, 61	Dietner	159
Beyond	141	Microgram	199	TPGI	43	Dragon Dictate	168
Cetra	55	Microprose	195	Unigraphics	127	Forte	173
Compucon	25	Minolta	47	Viewsonic	39	Mail Order	167
Contract Pro	189	Mira Networks	30	Westan	11	Microtech	164
Creative Pacific	29	NEC	23, 45			Nasa Technologies	169
Dell	IFC, 27, 51, 109, IBC	Net Registry	53	CHANNEL		National Communications	172
Diamond Multimedia	125	Netspace	33	AVO	153	New Reality	162, 163
D-Link	20	NineMSN	99	Edge	154	Sigmacom	165
Epson	15	Ocean Office	110, 111	Global	155		
Gateway	70-75	Oki	34	Protac	156, 157	MARKETPLACE	175-184
Gigabyte	57	OzEmail	2, 3	Espco	158		

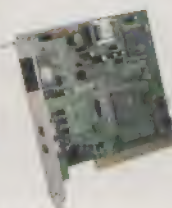
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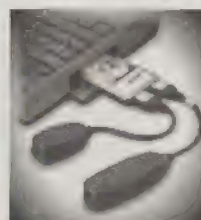


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THE COST OF SUCCESS

Kinda from down under

Despite ongoing complaints about a lack of venture capital funding, Australian IT companies are continuing to make an impact on the world stage. However, a spate of recent successes demonstrate an important fundamental principle: you can develop your product locally, but you have to sell it in the US.

At the recent Lotusphere conference, two Australian companies were finalists in the annual Beacon Awards, designed to recognise excellence in software design and implementation. FishTech scored a Distinguished Achievement award, and two products from Sydney-based developer Sentor were finalists in the 'Greatest business impact for a single customer' category.

Sentor managing director Martin Fisk told APC after the awards that this "shows that the quality of the work we do here in Australia is as good as anything in the world. The only difference is in the scale... It's really good to match it with every continent in the

Continued on page 22

FEELING INSECURE?

How to beat the notebook thief

The modern notebook is small, powerful and capable of storing huge volumes of data, thanks to rapid falls in hard drive prices. As such, it's a useful addition to any executive's working life — and a perfect target for thieves.

A recent break-in at the NSW Department of Health, where a notebook allegedly carrying a replica of a sensitive database was stolen, is a neat illustration of technology's dazzle blinding users to the possibility of danger.

Reports in the *Sydney Morning Herald* indicated that the fact that the notebook was stored on a secure floor raised the possibility that the theft was an inside job. Department of Health representatives stated that a full audit was under way to determine the extent of the loss, but declined to give further information.

Although notebook computers are a likely target for thieves due to their size and portability, another recent break-in involving the theft of two servers from Amnesty

Four ways to secure mobile data

- Make sure the work environment is secure; encourage employees to challenge strangers, and conduct security audits;
- Use the notebook's built-in BIOS password;
- Encrypt the hard drive;
- Implement a system of indelibly marking the computer's chassis.



International's Sydney headquarters shows that no computer is safe. *The Australian* reported that the servers contained the credit card details of 150 "high-profile" Amnesty supporters. Despite the data being encrypted and under password protection, Diners Club and American Express cancelled and reissued the accounts involved to "avoid embarrassment".

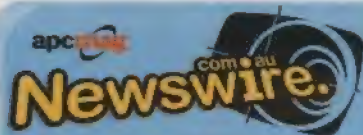
Statistics on computer theft are difficult to obtain, and statistical breakdowns outlining the number of notebooks stolen across Australia are wellnigh impossible to track down. State police services don't centralise theft data

from regional patrols, while insurance companies prefer not to talk about their experiences with notebook theft for fear of setting precedents for future claims.

It's clear that an increasing number of companies are opting to replace desktop computer systems with notebooks; and it's also clear that many organisations don't realise that notebooks can pose a threat to their business if a theft occurs and the hard drives aren't secured.

Com Tech's national security manager Bob Hey said that many companies simply

Continued on page 22



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Kinda from down under

Continued from page 21

world, especially the United States, and get right up there."

Sentor, however, is unusual in receiving global recognition for what are essentially local products (its nominated products were Streamlink, an electronic procurement system, and a customer relationship management system for RAMS Home Loans). Many other local firms are still living by the maxim that full-scale IT success means a heavy presence in the US market, and often a partnership with an established US firm.



Enterprise systems developer Mincom, for instance, which has enjoyed overseas success for some time, is now planning an IPO on the US Nasdaq exchange in the near future. While Mincom reportedly plans to maintain its local headquarters, the US presents a better opportunity for added funding and growth.

"The board took the decision to [list] because the company is growing rapidly, and a Nasdaq offering will enable us to access the capital for growth," executive vice-president Jock O'Keeffe said. Mincom proposes to make about 10% of its staff (about 110 people) redundant as part of its IPO preparations.

A similar tale can be told of local groupware developer 80-20 Software, which has announced an investment by Intel and VC firm Allen & Buckeridge. "We have got to

be seen as a North American software vendor," CEO Frank Stranges said. Intel officials said that country of origin was never a major selling point in investment decisions, but they wanted products that could be marketed globally.

80-20 Software is pursuing what is an increasingly common strategy: developing locally and then selling on a worldwide basis. The same model has been used by companies as divergent as portal provider LookSmart, which developed a US-centred site in its Melbourne office first and then looked to the Australian market, and antivirus developer Cybec, which recently sold its assets to Computer Associates.

Such a move doesn't mean abandoning the essential 'Aussie' quality of the company. One of the conditions for Cybec's sale was that the local operation would be maintained and nurtured.

Cybec CEO Chris Morison (pictured) emphasised that the decision by Cybec founder and owner Roger Riordan to sell the business was not motivated by money, adding that Riordan had set out four conditions to be met before he was prepared to sell to anyone.

"He wanted the company to operate in the best interests of its customers; to see staff were provided with greater employment opportunities; that stakeholders got a good return; and, most importantly, that the product continued to make a strong contribution to software development in Australia," Morison said.

However, without the additional marketing opportunities offered by an established global player, it seems that few local firms are set to take on the world market single-handed.

Angus Kidman, Jeremy White and Roulla Yiacoumi

How to beat the notebook thief

Continued from page 21

don't understand their data obligations. "That health database is a prime example," he said. "The type of information it contained is covered by various privacy legislation — if someone got their hands on it and used it in an inappropriate manner, there would be significant legal ramifications."

Encrypting the hard drive is the easiest and most cost-effective method of securing mobile data, according to Hey, a comment echoed by Simon Johnson, technical director of security consultancy Shake Communications. "The problem is there are a lot of companies out there that simply aren't aware that these options are available," Hey said.

Securing data through encryption is the most effective way of protecting information, but there is still a long way to go before many

organisations tighten up the physical security of their buildings. "There's one job I had that comes to mind," Johnson said. "A company had a security system that used electronic pass keys to allow access to various parts of the building. The problem was that it was possible to access any of the floors through unlocked doors in the fire escape. Once I was on the floor, it was simply a matter of finding a cleaner and asking them to let me in. Many people are still reticent to challenge strangers in the work environment."

Physical security can also extend to labels that chemically mark the plastic case of the notebook computer itself. "Over time, physical markings would dissuade thieves that are just interested in flogging the computer down at the pub. Corporate espionage is a different matter altogether," Johnson said.

Josh Gliddon

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COMPETITIVE PUSH

ACCC slams Telstra price proposal

The Australian Competition and Consumer Commission (ACCC) has found that Telstra has been charging other carriers twice as much as is acceptable to interconnect to its network. The draft ruling could bring down the cost of long-distance calls if the savings are passed on to consumers rather than pocketed by Telstra's long-distance call competitors.

Competition in the \$5 billion international and long-distance call market in Australia is only possible through access to Telstra's network. Charges for this interconnection make up at least 35% of the cost of providing long-distance calls. When the carriers could not come to commercial agreement over the charges they should pay Telstra, it submitted an undertaking on its charges to the ACCC. The ACCC has been examining this undertaking since November last year and released its draft determination in late January.

"The ACCC concluded that for the proposed charges to be acceptable, they would need to be halved," ACCC chairperson Professor Allan Fels said. He added that halving interconnect charges could reduce the

cost of national long-distance calls by 15%. "A lower price for interconnection would be likely to encourage long-distance companies to compete with Telstra for customers in areas, particularly country areas, where they currently don't offer long-distance services."

The draft ruling has been welcomed by Telstra's rivals, but the Australian Consumers' Association has outlined its concerns, saying that it is not certain savings will reach consumers.

Under the Trade Practices Act, the ACCC can arbitrate if Telstra and its carrier competitors do not come to commercial agreements on interconnection terms and conditions. As an alternative to this arbitration, Telstra can submit its terms and conditions to the ACCC, but these can only be accepted if the ACCC believes they are reasonable.

"The draft decision vindicates the Government's pro-competitive telecommunications regime, which has already delivered substantial improvements in service and reductions in cost to Australia consumers," acting communications minister Peter McGauran said in a statement.

Selina Mitchell

DON'T BANK ON IT

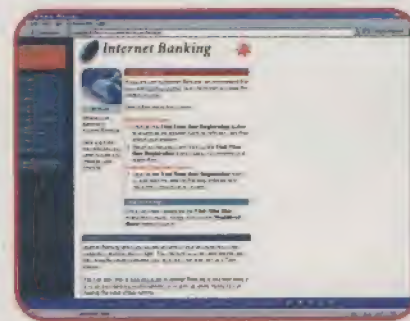
IT spending an eye opener

Contrary to popular belief, the banking industry is not the industry to spend the most money on IT, according to a new report.

Research company IDC found this honour belongs to the discrete manufacturing industry, which spent 7%

40% on IT services," said Stephanie Hutchinson, senior analyst with IDC's global research services group. "It is likely that this pattern has developed as a result of each market's need to address the Y2K and euro issues."

As APC reported last month (see APC February, page 24), despite attempts to cut branch costs by introducing electronic services, bank costs have actually increased in recent years. This has not stopped them from pursuing such services, however. In January, the National Australia Bank (NAB) began public beta testing of its



Internet banking service. NAB is the last of the four major banks to begin to offer an Internet banking service. Commonwealth Bank and Westpac are both offering complete services, while the ANZ is continuing testing with an invitation-only trial of its service. Although NAB originally planned to have the full service in operation by October last year, only staff of the bank had been able to test it.

Roulla Yiaccoumi

"They spend 40% on hardware, 20% on software, and



News Roundup

⊕ The Australian software industry generated \$2 billion in sales in 1996, a figure expected to double by 2001, according to a new report. The report, *Contribution of the Packaged Software Industry to the Australian Economy*, by PricewaterhouseCoopers, found that the software industry was responsible for nearly 26,000 jobs in 1996, and contributed tax revenues of over \$US459 million. Jim

Macnamara, chairperson of the Business Software Association of Australia, which commissioned the study, said that while the software industry made a significant contribution to the local economy, there was great potential for further growth, especially if piracy was overcome.

⊕ Australian staff have been spared from global cutbacks at two IT firms. Australian officials at ERP firm Manugistics said the local branch will be largely unaffected by plans to retrench 30% of the company's

workforce (about 400 staff). Similarly, Inprise will cut 20% of staff globally as part of a plan to split the company into two, but this won't affect the local office. Inprise will split into two divisions, Inprise and Borland.com. The former will focus on enterprise solutions, while the latter will create a developer-centric portal site and continue developing the Borland line of development tools.

⊕ The Federal Government appears to be shifting its stance on changes to capital

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POWER MAD

Overclockers rush to Celeron 300A

Local supplies of Intel's Celeron 300A processor appear to be drying up, following an apparent global shortage as Intel switches from its Slot 1 to its new Socket 370 form factor.

Component vendors Beyond Computers, Adelong Computers and the Sydney-based online store Computer Market have all confirmed that supplies of the 300A were patchy.

Darcy Wang, managing director of Computer Market, said he posted an announcement to customers after it became apparent that some stocks intended for Australia were being

overclock their processors (run them beyond the recommended speeds). Though Intel discourages this practice, Computer Market has controversially offered customers 'burn-in' tests, where 300A processors are run at 450MHz to confirm stability. It also provides overclocking discussion forums on its site.

An Adelong Computers spokesperson said the company had experienced a lot of trouble maintaining adequate 300A supplies recently, as its biggest-selling system was currently based on that processor. A spokesperson for Beyond Computers said the shortfall was only temporary, due to Intel's switch to Socket 370. Only Pioneer Computers said it had not

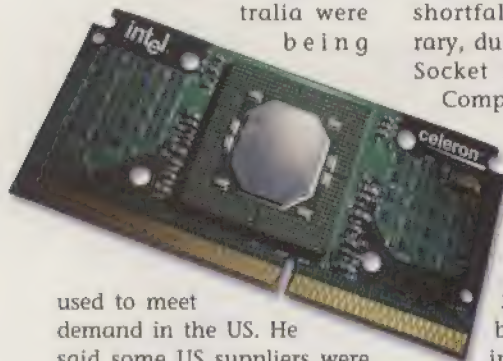
experienced any shortage.

Wang predicted the ABIT BH6 would also become scarce, and suggested the 300A shortage might be connected to Intel's introduction of extra

circuitry to prevent over-

clocking. The demand for the Celeron comes as Intel is preparing for the release of its Pentium III processor.

Simon Vandore



used to meet demand in the US. He said some US suppliers were already out of stock.

In recent months, Computer Market has pushed the combination of ABIT BH6 motherboards and the 300A — a current favourite combination for users who wish to

MOVE FOR REGULATION

Call centres: Tech sweatshops?

Call centres have become one of the key strategies used by Australian governments in a bid to increase employment, especially in rural areas. One recent study found that 62% of company transactions are already being processed by call centres.

However, concerns are growing over the conditions faced by workers in this emerging technology industry. Problems include heavy stress and excessive monitoring of staff.

The Australian Services Union (ASU), which represents 10,000 workers nationally, is calling for an award system for customer service operators, as well as standards to help ease the stress involved in the work.

Sally McManus, an ASU organiser, said there were three major issues for call-centre workers. Unlike the vast majority of industries, there is no award system for call-centre staff; there are no standards set for the monitoring of workers; and levels of stress for many staff are unacceptably high.

With moves to have some call centres operational 24 hours a day, and many staff already working through until midnight, McManus said it is

imperative for minimum conditions and wages, as well as shift allowances, to be introduced. At the moment employees will work an eight-hour shift that pays the same rate no matter what time of the day, week or year. Also, breaks are unpaid and overtime is usually not paid, she said.

As well, workers are over-monitored, she added. Monitoring occurs over the phone line as well as through the PC, said McManus. Phone line monitoring takes place in real time and if a mistake is made, the worker is called in to see their supervisor, she said. There is now also software available to allow a team leader to look at any networked worker's screen at any time.

"Stress is one of the biggest issues," McManus noted. "Often there are not enough staff so there are too many calls to take and constant pressure to work faster. These people work there because they like to interact with other people and they feel like they are constantly trying to get rid of calls to get onto the next one." McManus suggested that there should be time allowed to perform offline tasks, as well as time set aside for breaks every few hours.

Selina Mitchell



News Roundup

gains tax (CGT), paving the way for a possible boost to developing the IT sector. In last year's federal election, the role of CGT in helping boost the IT industry was a key technology issue. While Labor promoted a platform of CGT exemptions for high-tech industry, the Coalition refused to commit itself before the conclusion of an investigation into business tax reform by John Ralph. However, in an

opinion piece published in the *Australian Financial Review*, Alston clearly acknowledged that CGT will be essential in gaining start-up funding. Some Canberra observers have suggested that the opinion piece may be a means of gauging public opinion before announcing a new CGT policy.

Microsoft has finally managed to topple IBM from its long-disputed position as world's largest software company, according to a new report from research firm IDC. The IDC report, *Packaged Software:*

1998 worldwide performance preliminary results, found that the success of Windows and an effective pricing strategy enabled Microsoft to topple IBM from the number one position in 1998. The report was based on analyst reviews of 1998 quarterly results, as well as preliminary estimates from the fourth quarter of 1998.

For complete versions of these and many other stories, be sure to check into <http://newswire.com.au>.

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OPPORTUNITY KNOCKS

Call for biotech funding

Frustration over the lack of incentives for venture capital investment in IT is mirrored in the rapidly growing biotechnology industry. Australia is running the risk of being left behind due to a lack of investment in the industry, a peak council for scientists and technologists has warned.

The Federation of Australian Scientific and Technological Societies (FASTS) says that the high levels of investment in biotechnology in overseas countries threaten and challenge Australia, which runs the risk of becoming irrelevant in the 21st century.

A report by FASTS, *Biotechnology in Australia*, recommends a minimum new investment of \$500 million a year in biotechnology. Superannuation funds, it says, are a possible source.

"Australian biotechnology is in danger of falling behind

the rest of the world unless significant government initiatives in terms of strategic resourcing, and support for infrastructure, management training and industry are undertaken," the paper states. "The window of opportunity is relatively short, and therefore government needs to urgently develop a vision for Australian biotechnology and to undertake a significant investment in this area."

Future investment in biotechnology should focus on support for public sector biotechnology research and for Australian biotechnology companies and development of R&D management, the paper states. It also stresses that funding should not be moved from other areas of support for science and technology, but should come from new sources.

Selina Mitchell

CORPORATE PUSH PROMISED

Apple of many colours

Apple 'iCEO' (interim CEO) Steve Jobs used his keynote address at January's Macworld Expo to unveil the long-awaited Mac OS X Server, a new G3 minitower model, and an updated iMac in a choice of colours. Along with a range of updated Microsoft Net applications, these were the highlights of the show.

However, Apple's plans to reach back into the corporate market remain less clear.

Apple has put a fresh face on the iMac with a range of much-publicised new case colours and improved specifications. 'Bondi blue' is out: meet blue-

berry, strawberry, lime, tangerine and grape.

OS X is slated to play a key role in Apple Australia's attempt to re-engage the corporate market in 1999. The Queensland Police Service and Optus have remained loyal,

but several key local accounts — particularly in South Australia — defected to the Wintel camp during the years of turmoil prior to Steve Jobs' second coming. The ongoing success of the

iMac has also tended to colour Apple as an exclusively consumer-focused company in its latest incarnation.

Stephen Withers and Josh Gliddon


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SECRETS UNCOVERED

Hidden report reveals crypto paranoia

A university student in Tasmania has stumbled across a pivotal government report on cryptography which was mysteriously withdrawn from public view two years ago.

The report, *Review of Policy Relating to Encryption Technologies*, written by former deputy director-general of the Australian Security Intelligence Organisation (ASIO) Gerard Walsh in 1996, was intended to open the cryptography debate in Australia. Instead, its withdrawal from public sale some three weeks later — after it was already printed — led to rumours of political intervention.

Online civil liberties group Electronic Frontiers Australia applied for the report's release under the Freedom of Information Act in March 1997, but the application was rejected for national security, law

enforcement and public safety reasons. The EFA persisted, and in June of that year, obtained a censored version of the document. Supposedly 'sensitive' paragraphs had been removed and the EFA posted the sanitised version of the report on its Web site.



However, as is standard practice for government reports intended for public distribution, a number of copies had been sent to major Australian libraries by the printers, the Australian Government Publishing Service.

The Attorney-General's department was unaware that not all copies were returned following the unexplained cancellation of the report's sale.

Recently, a university student in Hobart uncovered a copy of the original report sitting in the city's State Library. It was forwarded to the EFA which has since

added the missing paragraphs to its online report. Paragraphs which were once considered too contentious to release publicly reveal something of the ignorance and paranoia regarding cryptography of the bureaucracy of the time.

Missing parts of the Walsh report included:

- An acknowledgement that encryption was a "looming problem which warranted close monitoring";
- A push for the Crimes Act 1914 to be changed to allow hacking by police and other law enforcement agencies;
- An admission that strong cryptography "which cannot be defeated by law enforcement and national security agencies" is already available;
- A proposal to allow the Australian Federal Police, the National Crime Authority and ASIO to "alter proprietary software so that it performs additional functions", in effect turning PCs into "listening devices".

Roulla Yiaccoumi

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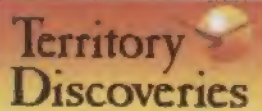
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YOU'LL NEVER NEVER KNOW IF YOU NEVER NEVER GO

The user base for Linux continues to grow — but can its unique development culture be maintained in a mass market?

The Linux identity crisis

The news that Lotus has joined the increasing number of companies porting software to Linux has been welcomed by many in the Linux user community — but for true devotees of open source software, there's a sting in the tale.

In late January, Lotus announced that it was reversing its longstanding policy of not developing for Linux, and it would release a version of the Domino server for the platform later this year.

The announcement was made as an almost embarrassed aside during the official opening to Lotus' annual love-in in Orlando, Florida, where the company officially launched Notes/Domino Release 5.0.

President and CEO Jeff Papows told the 10,000 attendees at the sixth annual Lotusphere that "It's got to the point that I can't leave my driveway without being accosted with this [Linux] question". Lotus officials have previously said the platform lacked support.

Speaking at a press conference later, Papows said the real turning point came following Lotusphere Europe in Berlin last November, where he had firmly reiterated that Lotus had no intentions of joining the Linux bandwagon. "Originally I thought, 'Who needs another Unix variant?'"

Papows said he was presented with compelling reasons to change his mind after returning from the trip. "After I said that, I got back and I just had so much hate mail, much of it from my boss!" Papows was clearly worn down by the relentless pressure from Linux enthusiasts.

"Everywhere I went, everywhere from leaving the house in the driveway in the morning to literally . . . I took my kids to the movie theatre, and standing in the queue I was accosted."

The news adds to the corporate credibility which has been gained by Linux over the past year, as an increasing number of companies, including heavyweights IBM and Oracle, have ported key applications to the Unix-derived platform.

One immediate problem for Linux users is that Lotus has only committed to porting the server portion of Domino, rather than the client, which would reach

Serious grunt

Key new features in the Linux 2.2 kernel include:

- Support for custom kernels on non-Intel x86 processors
- Improved SMP support for up to 16 processors
- Support for wide range of filesystems
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a much wider user base. Lotus' policy is that non-Windows platforms (with the exception of the Mac) will be supported through Web browser access, despite speculation in several Linux discussion forums that a native client will be announced shortly.

However, a bigger issue for the growing Linux community is the increasing distance between the notion of 'Linux software' and 'open source'. Linux itself was developed under an open source model, which means that the source code for the OS and all modifications must be made freely available. While companies such as Red Hat and Caldera can sell commercial versions of the product and charge for support, the source code for their modifications must be made available for use by others.

Many companies which have ported software to Linux have also adopted the open source model — Netscape's Mozilla project is the most notable example. But Lotus has not chosen to go down that path; while a Linux server will be made available, the code will be kept private, and only Lotus will distribute it. Speaking after the Linux announcement, Papows said, "That does not mean open source or freeware, so cheques and money orders are still welcome."

Many Linux users believe that keeping

software source code private in this fashion leads to lower quality. "Domino on Unix looks & performs just like what it is: typical Windoze the-hood-is-welded-shut bloatware (with all that implies)," wrote one poster to Slashdot, a widely visited discussion Web site for open source software. The issue is also a political one; many Linux users see using the operating system as a demonstration of support for the concept of open source software, and are reluctant to use products that are not open source.

However, as Linux becomes increasingly popular, its user base will continue to widen from devoted 'techies' committed to the open source model to users who are not concerned about the way in which software is developed and distributed.

The most recent kernel update to Linux, 2.2, was also released in late January, adding to the software's visibility in the technology mainstream. Because Linux is developed cooperatively, release numbers do not have the same significance to many Linux users as major upgrades of more conventional commercial software.

Devoted Linux users are often happy to work with development kernels, although these are less stable than official point releases. However, as Linux' user base continues to grow, milestone releases such as 2.2 take on greater importance, and have been treated as the equivalent of 'gold' releases by commercial software companies and by many writers in the technology press.

Some already fear that the increasing commercialisation of Linux will compromise its original goals. "We must take this stuff as a means of developing layers of defence around the Open Source community and the Linux flagship," another poster to Slashdot noted. While not all users will view the situation in such medieval terms, it seems clear that with acceptance of Linux looking increasingly solid, many Linux advocates are preparing themselves for the next stage of the battle.

Angus Kidman and Jeremy White

Jeremy White attended Lotusphere as a guest of Lotus.

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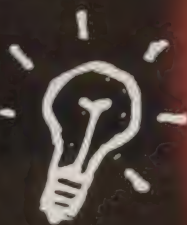
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A round of new proposals will see a spate of privacy, ecommerce and copyright regulations for the online world.

Tech legislation on the table



ustralia's online community is about to find the long arm of the law extending further into its domains. A number of new bills planned for introduction into Parliament in the early part of this year aim to update existing legislation to cope with the challenge of digital environments.

In late January, Federal Attorney-General Daryl Williams released the draft of the Electronic Transactions Bill. It is designed to be used as the blueprint for a national uniform legislative scheme for ecommerce.

The Federal Government has opted for a broad-based technology-neutral approach to digital signature legislation, deciding against strict technological requirements for digital signatures.

"A number of jurisdictions overseas have enacted such legislation, but they are technology-specific, contrary to Australia's technology-neutral approach," said Williams at the launch of the draft bill. "Also, there is no internationally uniform approach to electronic signatures, creating a risk that an inappropriate legislative regime may be adopted without regarding the needs of the market."

The bill allows digital signatures to meet existing requirements for manual signatures, he said. Electronic signatures can be recognised where appropriate without prescribing particular technology requirements.

"The government recognises that there may be consumer and small business uncertainty about electronic signatures and that confidence in electronic commerce is essential to the success of the 'market led' information economy in Australia. Yet, it is the government's view that legislation is not the most appropriate way to encourage confidence in the use of electronic signatures."

The aim of the bill is to encourage the uptake of electronic commerce, said Williams. "The government cannot legislate for trust and confidence in the information economy. However, it can foster an environment that encourages and supports business to adopt appropriate protections. It can do this by leading the delivery of online services and developing legislation such as the Electronic Transactions Bill."



The bill is based on the United Nations Commission on International Trade Law's Model Law on Electronic Commerce, which emphasises two principles: technology neutrality and media neutrality. This ensures that the law does not discriminate between different types of technology or between paper-based and electronic-based commerce. Williams will introduce the legislation in the autumn sittings of Parliament.

The Federal Government also used the launch of the legislation to outline some of the details on its proposed privacy legislation for the non-government sector and its new approach to copyright in the digital age. Last December, the government reversed its longstanding opposition to privacy laws for business, announcing a set of legislation due for introduction in the first quarter this year.

Williams noted that unless privacy concerns were eased, it is unlikely consumers will participate fully in ecommerce, but added that it was important not to overburden business with regulations. "My aim is to ensure that the legislation is practical and provides effective protection for individuals, without imposing undue burdens or constraints on business," he said.

On the copyright front, proposed changes would ban 'circumvention devices' such as password cracking software and pay TV decoders, while limiting liability for Internet service providers (ISPs) whose customers illegally distribute copyright material and allowing temporary copies to be made for transmission purposes.

Since last year, the Federal Govern-

ment has been discussing changes to the Copyright Act to bring it in line with digital media. Those changes will be introduced during an early sitting of Parliament this year, Williams said. An exposure draft of the legislation is due for release shortly.

The new act will replace current technology-specific broadcasting rights with a new "technology-neutral right of communication with the public". The government hopes that eliminating specific technology references will obviate the need for frequent changes to the law.

Exceptions will be built into this right to limit the unauthorised use of copyright materials. The broad aim is to provide similar protection to that afforded to print materials, Williams said. Print documents can be legally copied by libraries and educational institutions, and limited copies can be made for research purposes.

One of two major changes proposed to the law is a provision which would ban devices designed to allow illegal access to copyright materials. This would include programs that allow passwords to be cracked, although controlling the distribution of these online will probably prove difficult.

The second would limit the liability of ISPs whose customers use their networks to illegally distribute copyright materials. To date, this has been a legal grey area; ISPs have vigorously protested that they cannot be held responsible for individual customer activities.

The news was welcomed by local ISPs. "It's a sensible step in encouraging more widespread use of the medium. It gives people more certainty," said OzEmail corporate affairs director Michael Ward. "To limit the liability of Internet service providers and carriers that transmit that information is obviously a very sensible precaution. I would expect, though, that by putting a ceiling on the liability of Internet service providers, there is also a responsibility on ISPs to behave responsibly in relation to the distribution of material." Ward noted that similar requirements were imposed by the Internet industry code of conduct proposed last year.

Selina Mitchell, Angus Kidman and William Maher

SGI Visual Workstation 320

Late in 1997, SGI decided that it needed to defend itself against the incursion of Windows NT in the workstation market by developing its own Windows NT machines. It realised Windows NT for the MIPS processor wasn't a viable competitive option, so it began to design its own Intel machines, abandoning the MIPS processor and looking to Intel's Pentium II and Xeon. The result was the Visual Workstation range.

If you're looking for a state-of-the-art x86 machine, you need go no further. APC reviewed a Visual Workstation 320, running with a single 450MHz Pentium II processor. The system design is everything we've come to expect from SGI. Only top quality components are used, and it shows. The case design is colourful and unique, the mouse and USB keyboard are top class, the speakers are very good, and the 17.3in LCD deserves a review of its own. The flat-panel monitor is a real eye-catcher; the quality is incredible, and it has wide screen 1,600 by 1,024 resolution and both DDC and VGA connections, as well as a great design. SGI sells this monitor, the SGI



1600SW, separately, but it's not cheap at \$5,408. The system is also available with a CRT monitor or no monitor at all.

Internally, SGI has also taken a different approach. Rather than using a collection of standard off-the-shelf PC parts, it has developed a whole new architecture for PCs. The key component is the Cobalt chipset, which uses a proprietary bus to deliver many times the memory bandwidth of normal PCI/AGP systems. The graphics memory bandwidth equates to a peak speed of 3.2G per second, three times faster than 4x AGP.

Its other interesting aspect is the UMA-style interface. Main memory and graphics memory is actually shared, to the point where you can specify how much of your system memory is devoted to graphics and how much is devoted to other tasks. Of our 256M, we had 48M devoted to graphics.

The system also does away with the BIOS, instead using a more advanced ARC-PROM for system initialisation. While at the moment this only supports Windows NT, some preliminary work has started towards getting Linux to work on these systems. The version of Windows NT that runs on these systems has some special

extensions that make it work with the architecture, but SGI claims it is 100% compatible with Windows applications. We certainly had no trouble with it, even running the notoriously fickle Ziff-Davis Winstone and WinBench benchmarks.

The innovative architecture pays off in performance terms. The system performed a little better than a Gateway 450MHz Xeon system with a Riva TNT-based card in Winstone, and blew it away in terms of OpenGL performance. The Visual Workstation achieved a score of 26.77 in High-End Winstone 99, compared to the Gateway's 24.07. The performance of its graphics subsystems for 2D was a little below that delivered by the Gateway, though. When we ran a suite of Viewperf benchmarks (which run through scripts to evaluate the OpenGL performance of a system), the SGI system truly showed its colours; it consistently scored as much as double the Gateway system.

The system also has a wide range of I/O options: composite and S-Video in and out; both RCA and standard audio jacks; two USB ports; two FireWire ports; Fast Ethernet; and serial, parallel, PS/2, VGA and DDC ports.

Among the more standard components, a regular floppy drive is supplied, along with a 32x CD-ROM drive and 6.4G UltraATA hard disk. These components could be improved — an LS-120 drive, DVD-ROM and SCSI subsystem would not go astray.

In spite of these fairly minor quibbles, this is a power user's dream machine. Businesses in design and multimedia industries looking to make the move to NT should take a good look at this range.

Nathan Taylor

SGI Visual Workstation 320

■ Distributor	SGI
■ Phone	1300 364 744
■ Online	http://www.sgi.com/
■ Price	\$10,505 without monitor; \$5,408 for LCD monitor.
■ In short	An extremely well-designed machine.

Ziff-Davis results	SGI Visual Workstation ¹	Gateway GX-450 ²
CPUmark32	1,120.00	1,256.67
FPU WinMark	2,290.00	2,330.00
Business Disk WinMark 99 (K/sec)	3,443.33	2,913.33
High-End Disk WinMark 99 (K/sec)	7,856.67	5,966.67
Business Graphics WinMark 99	156.00	214.33
High-End Graphics WinMark 99	315.00	379.00
High-End Winstone 99	26.77	24.07
Viewperf results		
AWadvs-02 weighted geometric mean	15.75	8.94
CDRS-04 weighted geometric mean	57.71	49.66
DRV-05 weighted geometric mean	11.00	5.67
DX-04 weighted geometric mean	15.06	8.71
Light-02 weighted geometric mean	1.71	0.95
ProCDRS-01 weighted geometric mean	13.87	3.84
Total	115.10	77.76

1. An SGI Visual Workstation 320. A single Pentium II 450MHz, 256M RAM (211M available), 512K level 2 cache, 6.4G IDE hard disk, 32x CD-ROM, Cobalt graphics controller, NTFS file system was used for testing, running Windows NT 4.0, SP3. Tested at 1,024 by 768 resolution with 16-bit colour.

2. A Gateway GX-450, a single Pentium Xeon 450MHz, 128M of RAM, 512K level 2 cache, IDE hard disk, 4.8x DVD-ROM, nVidia TNT graphics controller, NTFS file system was used for testing, running Windows NT 4.0 SP4. Tested at 800 by 600 resolution with 16-bit colour. Both products used in this test were shipping versions available to the general public. These tests were performed without independent verification by Ziff-Davis, and Ziff-Davis makes no representations or warranties as to the results.

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Cybernet PC TV



In the face of it, connecting a computer to large-screen TV and a modem would seem to be an obvious path towards the connected home of the future. Information at your fingertips and all that.

This is exactly what Cybernet has done with the PC TV, a 68cm TV bundled with a slimline, Cyrix-powered Windows computer, packing a 4.3G hard drive, 64M RAM, 56K modem and 2x DVD player/MPEG decoder. Also included is an infra-red keyboard incorporating a joystick-style mouse, and an infra-red receiver which is intended to be mounted on top of the TV unit. All components are finished in tasteful, high-tech black, presumably to integrate with devices such as video recorders and home theatre units.

Using the 233MHz Cyrix MediaGX processor is an unusual decision considering the superior performance available from both Intel's budget-priced Celeron line and AMD's K6-2 range. This decision ultimately limits the usefulness of the product, as well as the potential for end user upgrades. It would be possible to substitute another PC altogether, but it would disrupt the homogenous styling of the product. Overall, it appears that the PC



biggest handicap because of the way it handles text. While the display did not appear obviously interlaced, the text was still wobbly and vaguely blocky. You'd need to set the text size very high to make it usable, and even then your eyes would suffer.

The natural task for such a huge screen is playing games, which is far less dependent on screen quality than regular PC productivity tasks like word processing, using spreadsheets or sending email. The only problem is that the PC TV doesn't have the processing grunt or the high-end graphics cards necessary to take advantage of both the big screen and the 3D capabilities incorporated into cutting-edge games. There's also the problem of connecting a joystick to the unit, as the infra-red receiver doesn't have an additional port for an infra-red capable game controller.

If games are ruled out, there's not much that the PC TV is really useful for. Answering email is a possibility, as long as the display point size has been adjusted to render it sufficiently readable. It would also be possible to do word processing or enter data into a spreadsheet, but whether that's a sensible option is another matter.

The other possible use for the PC TV is as a large-scale Web browser. The mouse/joystick incorporated into the keyboard makes scrolling easy, and the mouse buttons (mounted just below the joystick) have a nice, nubby tactility similar to that found on the Microsoft's IntelliMouse wheel. But again, the utility of using the PC

TV as a Web browser runs hard up against the problems inherent in the display. If the Web page is well designed and high contrast, and as long as the maximum browser font size is selected, there aren't too many problems. If the page is badly designed, uses clever font styles or has lots of bright colours, the PC TV is almost unusable for Web browsing. Finally, even with a speedy modem connection there's going to be a lot of time wasted looking at a very large, badly resolved and ultimately static screen. Large-screen TVs weren't designed to be mistreated this way.

There are myriad other problems associated with using the PC TV as a PC. The standard Windows 98 desktop, for example, looks terrible, simply because it's not intended to be viewed from a distance. And those that think these problems could be cured by playing with font sizes should think again: it doesn't improve matters one iota. Using productivity software in the lounge room presents its own difficulties. How would you go trying to write a report in a space shared by other members of the household?

Finally, the way that Cybernet has integrated the TV tuner within the TV itself is an advantage, but also one of the unit's weak points, because it makes it difficult to use the PC TV for video capture and video editing. On the upside, this integration eliminates potential problems that could have arisen with RF interference if the tuner had been incorporated in the body of the PC. It also enables the buyer to substitute another PC should they need greater processing power.

Overall, the PC TV is an interesting idea, but its potential is let down by the quality of the screen images and lack of processing power. Its role in the lounge room as an adjunct to a home theatre system is also questionable. If Cybernet had stuck something a bit more powerful in the box — and at the price, it could have — you would have a truly worthy product.

Josh Gliddon

Benchmark results

CPUmark32	228.00
FPU WinMark	345.33
Business Disk WinMark 99 (K/sec)	1206.67
High-End Disk WinMark 99 (K/sec)	4133.33
Business Graphics WinMark 99	22.90
High-End Graphics WinMark 99	63.10
Business Winstone 99	6.41

Disclosure: A Cybernet PC TV, a single Cyrix MediaGX 233MHz, 64M of RAM, IDE hard disk, 2x DVD-ROM, MediaGX integrated graphics, FAT16 file system was used for testing, running Windows 98. The product used in this test were shipping versions available to the general public. These tests were performed without independent verification by Ziff-Davis, and Ziff-Davis makes no representations or warranties as to the results.

unit was very much an afterthought, selected for its price and appearance rather than performance and utility for the user.

As far as TV screens go, this is a good one. The screen is large, the picture is clear and has reasonably good resolution. Sound from the integrated stereo speakers is also passable for everyday use. Home theatre enthusiasts and gamers, however, would be well advised to connect a set of aftermarket speakers, amplifier and sub-woofer if a standard of sound that matches the standard of the TV image is desired.

This large screen is also the PC TV's

Cybernet PC TV

■ Distributor	Cybernet Entertainment
■ Phone	1800 626 858
■ Online	N/A
■ Price	\$5,495
■ In short	An idea in search of an application.

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Dell Inspiron Pentium II 366MHz and Celeron 300MHz notebooks

Dell has been quick off the mark to supply APC with notebooks featuring Intel's latest mobile processors, the Pentium II 366MHz and the Celeron 300MHz.

Putting both notebooks to the test returned some interesting results. The Pentium II 366MHz, a much faster processor than the budget-conscious Celeron 300MHz, scored better overall performance results, but in some cases the difference was not outstanding. Buyers will, however, notice the \$2,000 price difference.

The Pentium II 366MHz notebook, the Dell Inspiron 3500 D366ST, is powered by 512K of secondary cache and 64M of RAM. Its Celeron cousin, the Dell Inspiron 3500 D300GT, features a quarter of the secondary cache (128K) but double the RAM (128M). Otherwise, both notebooks have similar black casings and specifications. The exceptions are the drives and the modem. The Pentium II machine packs in a 6.4G drive, leaving the smaller 4.3G unit to the Celeron notebook. It also includes a Zip drive and internal 56K modem, neither of which are included with the Celeron unit.

In the Business Winstone 99 test, the Pentium II's score of 17.6 just edged out the Celeron's 16.1. Similarly, in the High-End Disk WinMark 99, the Pentium II's larger hard drive had little effect on the disk tests. Its 5,983 score was not far above the Celeron's 5,940. Indeed, the Celeron turned the tables in the Business Disk WinMark 99, scoring 1,893 and outdoing the Pentium II's result of 1,760. However, the Pentium II did much better in the graphics tests, and in the case of the Business Graphics WinMark 99, almost doubled the result.

Both feature the same NeoMagic MagicMedia video chip with 2.5M of video RAM. While the Pentium II sports a DVD-ROM drive (MPEG-2 decompression is provided via a PC Card), the Celeron makes do with a 24x CD-ROM drive which performed much better in Ziff Davis' CD-ROM tests. The Celeron also outperformed the Pentium II in the BatteryMark test, even though both use the same type of lithium ion battery. Because the Celeron notebook does not have such a powerful processor to support, its battery lasted 10 minutes longer than the Pentium II's two hours and 22 minutes.

After one hour's continuous use, neither machine felt hot underneath. We were not



concerned so much about the Celeron unit, but were pleasantly surprised that the Pentium II unit was not warm to touch.

The notebooks feature large crisp 14.1in TFT displays. Neither machine is overly large, but the screens contribute significantly to their cumbersome weight and size.

Both machines feature the standard serial, parallel, mouse/keyboard and external monitor ports, as well as USB, infra-red and docking station/port replicator connectors. The units are covered by a one-year warranty.

Both notebooks performed very well and are reasonably priced. High performance users would want the DVD-ROM drive, Zip drive, and modem, but for others, a notebook minus the bells and whistles that costs \$2,000 less will have greater appeal.

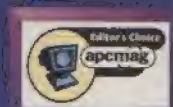
Roulla Yiacoumi

	Dell Inspiron 3500 D366ST	Dell Inspiron 3500 D300GT
Distributor	Dell	Dell
Phone	1300 303 263	1300 303 263
Online	http://www.dell.com.au/	http://www.dell.com.au/
Price	\$6,049	\$4,067
Specifications		
Processor	Intel Pentium II 366MHz	Intel Celeron 300MHz
Secondary cache (K)	512	128
Tested/maximum RAM (M)	64/256 SDRAM	128/256 SDRAM
Hard disk drive	6.4GB IBM-DADA-26480	4.3GB Fujitsu MHF2043AT
Hard disk file system	FAT32	FAT32
Internal Zip drive	Internal	None
Video bus type/RAM	AGP/2.5M SGRAM	AGP/2.5M SGRAM
Video controller chip	NeoMagic MagicMedia 256AV	NeoMagic MagicMedia 256AV
Tested resolution/colours/refresh	1,024 by 768/256/60Hz	1,024 by 768/256/60Hz
Pointer device	Touchpad	Touchpad
Dimensions (cm) (L by W by H)	32.5 by 25.9 by 3.9	32.5 by 25.9 by 3.9
Bare minimum weight (kg)	3.12	3.06
Travel weight (kg)	3.46	3.85
PC Card slot type	2 Type II or one 1 Type III	2 Type II or one 1 Type III
Port replicator	Yes	Yes
Docking station	Optional	Optional
CD-ROM drive	Matshita DVD-ROM SR-8171	24x Toshiba CD-ROM XM-1802B
Tested CD-ROM controller	ATAPI/Windows	ATAPI/Windows
Soundcard	NeoMagic MagicWave 3DX	NeoMagic MagicWave 3DX
Modem	56K	None
Display	14.1in XGA TFT colour LCD	14.1in XGA TFT colour LCD
Maximum internal resolution	1,024 by 768 by 24-bit	1,024 by 768 by 24-bit
Maximum external resolution	1,280 by 1,024 by 8-bit	1,280 by 1,024 by 8-bit
Battery Type	Lithium ion	Lithium ion
Operating systems available	Windows 98	Windows 98
Warranty terms	1 year	1 year
Benchmark results		
Business Winstone 99	17.57	16.07
CD-ROM WinMark 99 (K/sec)	803	1,210
CPUMark32	957.3	619
FPU WinMark	1,940	1,583.33
Business Disk WinMark 99 (K/sec)	1,760	1,893.33
High-End Disk WinMark 99 (K/sec)	5,983.30	5,940
Business Graphics WinMark 99	113.3	64.63
High-End Graphics WinMark 99	241	195.67
BatteryMark 2.0 (hours:minutes)	2:22	2:32

Note: All systems are tested under a screen resolution of 1,024 x 768 pixels with 16bit colours, refresh rate of 60Hz. The product used in these tests is the shipping version available to the public at the time of publication unless otherwise stated. Winstone, Winbench and associated products are registered trademarks of the Ziff-Davis Publishing Company. These tests were performed without independent verification by Ziff-Davis Publishing Company.



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Voice recognition as a time and labour saver is fabulous, or at least it would be if it worked flawlessly.

Dragon NaturallySpeaking Preferred

Getting it right is no easy task for voice recognition companies, as every single person speaks with different pronunciation and inflections. There are portions of speech that do sound similar when spoken by different people, and voice recognition software focuses on this. NaturallySpeaking also looks at the preceding word and the following words and makes more intuitive guesses about what the middle word should be. This takes a lot of hard drive space and processing oomph. As greater and greater processor power is available every day, voice recognition software is now nearing the mark.

Having played with, used and become frustrated with the version of NaturallySpeaking that ships with some copies of Corel WordPerfect, I wasn't really expecting much other than rarely recognised speech and misspelt sentences. Late last year, both IBM and Dragon systems released the latest versions of their voice recognition software, and although we reviewed IBM's ViaVoice 98 Executive in January (see APC January, page 44) and were impressed with the advancements in voice recognition, it has taken a while for the new version of NaturallySpeaking to cross our desk for comparison.

Simply put, it works a lot better than its predecessors ever did, and comes within a nose of the accuracy proffered by IBM. Unlike ViaVoice 98, the version of NaturallySpeaking Preferred that we tested was not optimised for Australian accents, but it came close by pegging it in UK English rather than US English. Regardless of this, the recognition was almost on par with that of ViaVoice 98.

With all recognition software, you have to train it to recognise your particular tonal inflections and nuances. The

training for NaturallySpeaking Preferred is much the same as for the earlier releases — a quick two-minute reading followed by an optional 30-minute reading. There are three of the 30-minute passages to choose from, and it is worth using all three, as the

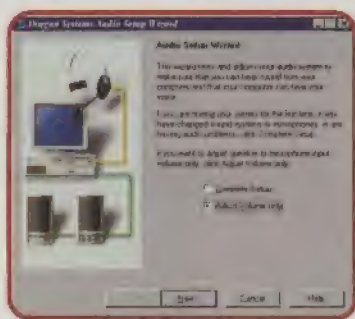
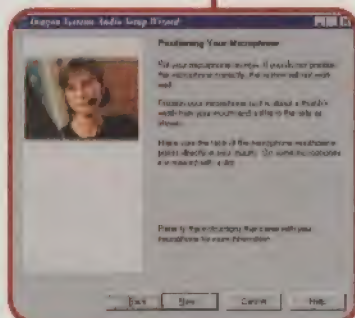
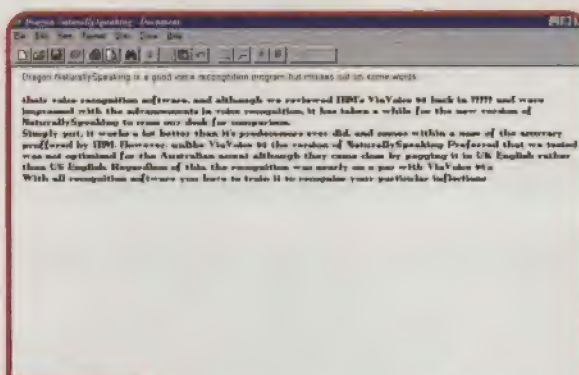
the mouse. With voice commands you can press any key on the keyboard, including function and Windows keys.

NaturallySpeaking not only accepts dictation, it can also read text back to you using its new text-to-speech function. This is either going to be a feature that you'll love or hate — it's fine for short passages but not for anything long.

The new headsets that ship with it are an improvement; they are comfortable, adjustable and feature good sound pick-up. However, like the headset that ships with ViaVoice 98, the cord is too short, especially if your PC is not right in front of you. Aside from that one quibble, they are fine. You can adjust them to sit on the left or right-hand side of your head, and the mike arm is flexible.

If you plan on sharing the voice recognition software with others on the same system, you will have to think seriously about space constraints. Each person needs their own speech profile, which takes anywhere from a minimum of 10M each. Double that if you want to back it up. This all on top of the 170M that is taken up by the installation and training files alone. This may seem like bloatware, but voice recognition needs space and power to run. The minimum requirements for NaturallySpeaking are a Pentium 133 and 32M of RAM for Windows 95/98 or 48M for Windows NT 4.0. To use the Best-Match technology (the newer tweaked recognition engine) you need a minimum of a Pentium 200 processor.

Darren Ellis



more you train the system, the better the recognition results.

You can dictate straight into NaturallySpeaking (a no-frills word processor similar to Microsoft WordPad or ViaVoice's SpeakPad), or you can take advantage of the new NaturalWord feature to dictate directly into supported word processors (such as Corel WordPerfect 8.0 or Microsoft Word 97). Another new feature is the ability to dictate into almost any Windows program, like spread-

sheet programs or email clients, using NaturalText. When we tested the NaturalWord integration with Microsoft Word 97, we found it a lot more stable than the wobbly ViaVoice integration — it worked well and didn't crash once.

Spooky, fun and indispensable to the disabled is the ability to move the mouse around the screen and use it, plus the hands-free keyboard control. You can click, double-click and even drag and drop with

Dragon NaturallySpeaking Preferred

- **Distributor** Marketing Results
- **Phone** (02) 9899 5888
- **Online** <http://www.marketingresults.com.au/>
- **Price** \$349
- **In short** Great features and recognition, but it's not infallible.

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OR 1300 360 855

A painless way to set up a wireless network in the home.

Diamond HomeFree

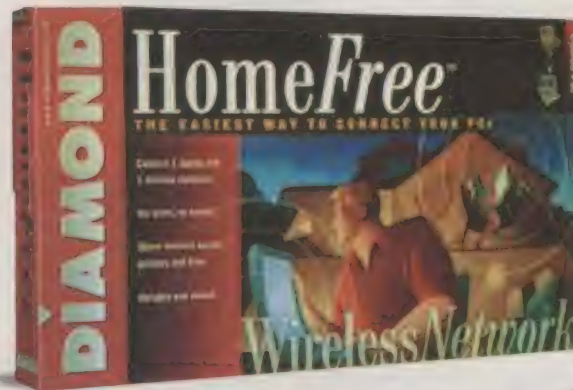
No mess, no fuss. That's the wireless aim of Diamond's radio frequency networking package, HomeFree. Plug in the cards, install the software and you're away. No cables, no ports, no drilling holes in the wall to snake Category 5 cable into the next room, and no need to sit all your computers together in a corner.

APC took a look at the ISA/PC Card 'Combo Pac', as wireless networking makes particular sense for those with both desktop and notebook PCs. PC-to-PC packs are also available. If you're willing to sacrifice significant networking bandwidth for the sake of sheer tidiness, HomeFree is definitely worth consideration.

The product consists of a simple 8-bit half-length ISA card with a smooth grey rectangle of plastic protruding from its faceplate, and a PC Card extended by an identical grey slab. Fortunately, these protrusions are not unsightly — compared to a traditional aerial, they're almost stylish. Installation, with the help of a glossy instruction poster and the methodical manual, was a simple process of plugging the cards in and following the software's prompts. Once the first PC was talking to the second, the installation program automatically set up Windows networking and a shared 'C:\Transfer' directory for file exchange. Setup requires very little technical knowledge.

However, the installation process did fail once on each PC. On the notebook, this was a result of accidentally clicking 'Next' at a certain point instead of selecting an option first. It was not clear how to restart installation once it had terminated (the options in the CD's root directory and its Autorun menu were quite unhelpful), so the only solution was to remove the hardware from Device Manager and let the system find it again. On the desktop PC, the installation program initially reported that the HomeFree hardware wasn't functioning. After double-checking that the card was sitting properly in its ISA slot, removing the driver from Device Manager again and rebooting, this glitch disappeared. As the second attempt on each machine was perfectly successful and HomeFree ran reliably afterwards, it's unlikely there was any real problem.

HomeFree operates at 1Mbps in the



2.4GHz ISM band, which is a very high frequency compared to 900MHz GSM mobile phones, for example. The packaging claimed a range of about 45m, and this proved fairly accurate when wandering around APC Labs — doors seemed to be no hindrance, but carrying the notebook down a flight of concrete stairs and walking to the other side of a large office building floor caused interruptions.

On the other hand, when the notebook was brought back in range, the network connection was automatically restored. The product randomly hops frequencies to avoid confusion with other HomeFree installations in the area or interference from other electronic devices, and if more cards are purchased, up to 16 PCs can join a single network. Minimum requirements for each PC include a 486-class processor, Windows 95/98 or NT, 8M of RAM and 10M of drive space. Things only start to get complicated when, for example, a notebook PC is configured for both an office network and a HomeFree arrangement in your house, though the manual provides some instructions on how to get around problems that may arise.

The manual also lists a few potential obstacles to effective wireless networking; network interruptions may be caused by large metal objects (such as a metal table), large bodies of water (if your computer backs onto a fish tank . . .), and placing your computer against a thick wall. Software is provided on the installation CD to check the reliability of your connections.

At 1Mbps, HomeFree performs significantly slower than wired networks (which are traditionally 10Mbps and increasingly 100Mbps). This is speedy enough for easy file transfer between PCs, although

very large files seem to take forever, and it's fast enough to play multiplayer games and share peripheral devices. But it's too slow for intensive real-time tasks such as playing movies from one machine's hard drive on the other machine's video card.

During our tests, large files (both binary and text) were transferred repeatedly without error, an AVI movie was played

across the network with very jerky results, and a multiplayer game of Unreal ran flawlessly. Just as on any physical network, it was possible to share any drive or directory and any peripheral device (such as a Zip drive or printer).

HomeFree can also be used to share a dial-up Internet connection across the network, conveniently eliminating the need for third-party software such as WinGate (or an extra phone line). Unless the Internet connection is via cable modem, 1Mbps is quite adequate for this task. The installation software can set up Internet sharing for you, presuming one of the PCs has dial-up networking already configured. Be warned that since HomeFree requires Windows' sharing facility to be active, there are some security risks in being connected to the Internet at the same time (make sure you have the latest security patches from Microsoft and be careful what you share).

Overall, HomeFree performs as advertised. The question is whether you are willing or able to sacrifice significant networking speed for the sake of convenience.

Simon Vandore

Diamond HomeFree

■ Distributor	Diamond
■ Phone	(02) 9460 2355
■ Online	http://www.diamondmm.com.au/
■ Price	\$549 for ISA/PC Card Combo Pac, \$499 for ISA/PCI desktop pack
■ In short	A neat, simple way to connect PCs, if you're happy to run a 1Mbps network.



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Dell Dimension V400c



When Intel launched another revision of its processor range, the predictable spate of new machines followed.

In addition to the other processors, the end of January saw the launch of two new Celerons for desktops — the 366MHz and 400MHz — which edged the performance of the Celeron that much closer to the high-end Pentium IIs. As with the new notebooks (see page 40), Dell has been the first off the mark in delivering desktop systems based on the new processors. We received the Dimension V400c, a 400MHz system.

The interesting thing about this processor is that it still uses the 66MHz bus, with Intel reserving the 100MHz bus for full Pentium II systems (presumably so people would still have some reason to buy Pentium IIs). Overclockers might find some benefit in this, but the 300A is still likely to be the chip of choice. Incidentally, this particular machine cannot be overclocked because the motherboard does not have the capability.

Apart from the processor, the Dell is a standard corporate desktop. Nothing too exciting here. It comes with 64M, and 8.4G IDE hard disk, a 40x CD-ROM and an ATI Rage graphics chip with 8M of graphics memory. It also includes a fine 15in monitor, a Turtle Beach Montego A3D soundcard and an excellent speaker/subwoofer.

Product	Dell Dimension V400c
Distributor	Dell
Phone	1300 303 263
Price	\$2,939
Online	http://www.dell.com.au/
Processor	Intel Celeron 400MHz
Level 2 cache	128K
RAM/type	64M SDRAM
Hard disk drive	8.4G Maxtor 90845DA-(PM)
Hard disk controller	Intel 82371AB/EB PCI Bus Master IDE controller
Hard disk file system	FAT32
Video adapter	AGP ATI Rage Pro Turbo AGP 2X
Video RAM size	8M SDRAM
Video controller chip	Mach64: RagePro
Graphics driver	macxw4.drv (4.10.24440)
CD-ROM drive	40x NEC CD-ROM drive:28C
Operating system	Windows 98
Monitor	15in
Soundcard	Turtle Beach Montego A3D

Business Winstone 99	18.80
CD-ROM WinMark 99 (K/sec)	1,450.00
CPUmark32	753.00
FPU WinMark	2,120.00
Business Disk WinMark 99 (K/sec)	2,673.33
High-End Disk WinMark 99 (K/sec)	8,313.33
Business Graphics WinMark 99	114.67
High-End Graphics WinMark 99	325.33

Note: All systems are tested under a screen resolution of 1,024 by 768 pixels with 16-bit colours, refresh rate of 60Hz. The product used in these tests is the shipping version available to the public at the time of publication unless otherwise stated. Winstone, WinBench and associated products are registered trademarks of the Ziff-Davis Publishing Company. These tests were performed without independent verification by Ziff-Davis Publishing Company.



As to be expected, its performance was very good, equal to a 350 to 400MHz Pentium II. The ATI Rage Pro chip included in the V400c is a little disappointing; a better graphics chip would improve performance. The system could not complete our 3D WinBench 99 tests as the video drivers had problems with the benchmark. However, its disk performance was outstanding.

The system scored 18.8 in Business Winstone 99. For comparison, a few months ago we tested the Hitachi LCD Desktop 310 with a 300MHz Pentium II processor (which costs about 10% more than a 400MHz Celeron at Harris Technology, for instance) and it scored 13.83 in the same benchmark. The V400c achieved scores of 753 in CPUmark32 and 2,120 in FPU WinMark, compared to the LCD Desktop's 742.33 and 1,540, respectively. Overall, it's a fine processor and system, at a bargain price.

Nathan Taylor

AOpen DVD-9632 and Pioneer DVD-A03S



AOpen and Pioneer have been first to release what they are calling third-generation DVD-ROM technology. These DVD-ROM drives, however, offer few technological advantages over second-generation DVD-ROM drives, save an improvement in data transfer rates. They do not read any formats, such as DVD-RAM, that their second-generation predecessors could not.

Both AOpen and Pioneer obviously feel the trayless slot loading mechanism — which has the added advantage of working while mounted sideways — is the way to go. Both claim to be 6x drives, but both are constant angular velocity drives, which means the data transfer rate varies. While the disk always rotates at the same speed, there is more space to store data on the outside of the disk than on the inside, so transfer rates are highest on the outside of the disk. The outside of the disk is the last part to be recorded,

and therefore the least likely to have data on it unless the disk is completely full.

We tested the EIDE/ATAPI versions of these new DVD-ROM drives (Pioneer also makes a SCSI version) using the CD WinBench 99 test suite. Both showed a significant speed improvement over the previous generation of DVD-ROM drives, for which 1M per second was an average transfer rate. AOpen's drive managed an average of 1.2Mbps in the CD-ROM WinMark 99 test, while Pioneer's drive averaged 1.5Mbps*. Both had peak data transfer rates of about 4.5M per second. This test measures CD-ROM encoded data; AOpen and Pioneer claim transfer rates of over 8M per second for DVD-ROM encoded data.

Right now, the Pioneer drive is the cheaper of the two, and given its better performance, is probably the best buy. Pioneer also plan to release a SCSI version of the drive shortly.

Josh Mehlman

AOpen DVD-9632/Pioneer DVD-A03S

Distributor	Servex
Phone	(02) 8762 3500
Online	http://www.servex.com.au/
Price	\$399

Distributor	Pioneer
Phone	(03) 9586 6300
Online	http://www.pioneeraus.com.au/
Price	\$299

* Tested on a Gateway GX-450, a single Pentium Xeon 450MHz, 128M of RAM, 512k level 2 cache, IDE hard disk, Nvidia TNT graphics controller, FAT32 file system was used for testing. Tested at 800 by 600 resolution with 16-bit colour. Test machines ran Windows 98 using system cache with access to all available memory. Both products used in this test were shipping versions available to the general public. These tests were performed without independent verification by Ziff-Davis, and Ziff-Davis makes no representations or warranties as to the results.




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MINOLTA

Drumbeat 2000

According to Drumbeat 2000's hype, it offers a complete and quick solution to create database applications for the Web, while designing the HTML interfaces to supplement them. The interface supplied with Drumbeat is excellent; it has a fully customisable set of onscreen elements. Drumbeat makes use of Microsoft's Internet Information Server and Active Server Page (ASP) technology to publish its applications through some reasonably well-constructed wizards and templates.

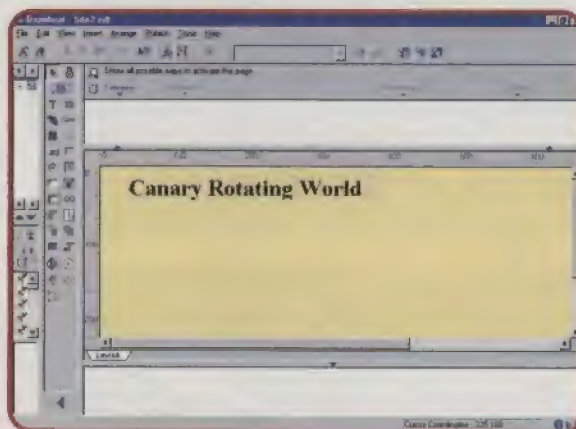
Drumbeat's approach to HTML editing is simplistic, to say the least. In order to build really impressive Web applications you'd need to look at combining the app-building features of Drumbeat with another HTML editor. It's a little curious that Drumbeat will let you edit application-specific queries, but doesn't include a simple HTML text editor. If you're a code junkie, look elsewhere — nearly every aspect of page and query production is non-editable within Drumbeat.

Its main appeal for non-HTML programmers lies in the well-laid-out user interface, which relies heavily on simple drag-and-drop functionality to access its features. Some simple HTML features are given the short shrift, but there are some neat touches. Drumbeat includes what it calls SmartPages options, whereby browser-specific versions of pages are dynamically published and updated to best serve each browser. It's also possible to modify individual pages so you can take advantage of any browser-specific features. We found it worked far better with Internet Explorer (as do most ASP-based applications), and in our testing of the page setups we found some minor Java elements that wouldn't consistently load in Netscape.

Drumbeat's army of features and scripts is impressive, and you can download more from the Drumbeat Web site. All features are presented as SmartElements (basically a user-defined set of Java, ActiveX and HTML controls) and are implemented using a simple right mouseclick and selection process.

The supplied SmartElements are well explained and logically laid out. They offer an option to apply multiple interactions and have Drumbeat dynamically adjust the code for multiple browsers, so it's very easy to create impressive sites with minimal

effort. Sites are laid out in a map function, and unlike Macromedia's Dreamweaver, the map is a constantly available subframe in the main Drumbeat page, as are the available (and easily applied) template setups. Template elements appear greyed out, so you won't hit any problems design-



ing over them by accident. Because of the easy access to templates, it's also quite simple to trial a page feature on one page, and then copy it over to the template for instant application to the rest of your site. Drumbeat will then even inform you that the source page you just copied from now has two copies and invites you to remove the offending extra copy.

The accent is on design over modifications, from the grid layout main view of pages to the all-but-hidden code working behind the scenes. It's possible to link Drumbeat to external editors for the purpose of code hacking, but it's really a tool aimed more at those looking to ignore (or be ignorant of) the coding process. In any event, the created code is reasonably clean, and certainly free of most of the coding oddities that packages like Microsoft FrontPage seem intent on placing within pages.

The main appeal of Drumbeat is in the ease and simplicity of creating database-enabled pages and sites with as little fuss as possible. The wizards are well implemented, and after walking through them a few times, it's very easy to then bypass them and create queries, forms and tables directly and simply. Everything from simple database queries to server-authenticated data creation is supported, and can be set up with a little practice. Drumbeat supports any ODBC-compliant database,

and any SQL-compliant queries, so that virtually any database and any query can be quickly linked and supported via the Web. Query creation is handled intelligently, although anyone unfamiliar with query creation will struggle a little at first.

Drumbeat is not without some minor quibbles. Due to the SmartPages feature, some simple tasks can be very slow to activate, as Drumbeat attempts to modify all its different pages to accommodate sometimes very simple changes. The setup for browsing images is a little more tricky than it should be — users need to specify and re-specify media libraries. It's IE-centric nature also limits it as far as total Web-accessibility is concerned, although this could be overcome in an intranet setup. APC also found a curious anomaly in terms of available help.

Although the Drumbeat site is overflowing with examples, tutorials, extra interactive elements and support, the shareware trial version of Drumbeat is missing its own internal help file. Sometimes downloading help from the Net may be the most dynamic way of maintaining up-to-date information, but for those starting out it can be slow, and a bit of a non-incentive to continue to the full-priced product.

What Drumbeat does, it does exceptionally well. If you're looking for a simple way to create database-driven pages, then Drumbeat certainly has a lot to offer, especially for anyone looking to implement on an IE-based intranet.

Alex Kidman

Drumbeat 2000

■ Distributor	Elemental Software (none yet in Australia, but available online)
■ Phone	N/A
■ Online	http://www.drumbeat.com/
■ Price	\$US399
■ In short	A simple and extremely powerful design-oriented Web tool.



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This new PanaFlat LC40 is a MultiScan colour TFT LCD Monitor, and it's part of Panasonic's new range of computer monitors. It's a range which gives you a choice between this LCD and CRT monitors in four screen sizes: 15", 17", 19" and 21". The new SL range of 17" and 19" CRT monitors are 20% shallower than any other CRT monitor, so their footprint is far, far smaller. And because the PanaFlat LC40 has a depth of only 149mm, its tiny footprint gives you a much bigger desk.

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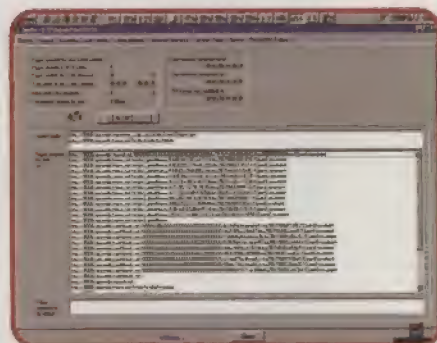
Swift & Linn PA NT

ISYS Spider 1.5

ISY Spider is an add-on to the well-known ISYS indexing engine. It's designed to index the contents of Web domains that aren't available to the vanilla ISYS engine, such as the contents of remote Web sites, remote intranet servers or Lotus Domino servers. It works like the spiders used by the big commercial search providers like AltaVista and HotBot: an agent follows links from Web sites and indexes the pages that it passes through. In the case of ISYS Spider, you determine which domains you want to index (for example, <http://apcmag.com>) and it will go through and create an index of all the pages accessible from the site's main page. If desired, it can even follow links off-site.

Getting Spider up and running is as easy as entering the starting URL, setting up options for static or dynamic pages and specifying the depth to which the Spider should index. There's also an option for Spider to ignore the ROBOTS.TXT file used to flag sites where Robots Exclusion Protocol de facto standard is in force.

Setting the Spider to pull in multiple threads speeds up the crawl; despite this, indexing is a bandwidth and server-intensive process (think of having to download



every single page on some of the larger sites!). Sites using a low-end or marginal server, or those with bandwidth constrictions should perform the crawl during low demand periods or out of hours. Fortunately, Spider can be set up to perform automatic crawls at pre-specified periods according to preset criteria. Still, it is best suited to intranet use.

Once the crawl has been completed, the index can be rolled into a traditional ISYS index and accessed by the ISYS Query tool. The alternative method, and the one most suited to Spider, is accessing the Index using ISYS Web, an HTTP server and Web front end to ISYS Query. Either method generally works well, but note

that Lotus Domino servers are particularly troublesome to index with ISYS Spider.

Work also needs to be done on Spider's user interface — its Visual Basic/Windows 3.1 ancestry is particularly noticeable at certain points, and although it is usable, commercial product interfaces should display a higher degree of integration. Online documentation and help is also lacking.

Overall, Spider is great for raw HTML and some types of dynamic sites. Webmasters of such sites looking for an easy indexing capability should look no further. Its level of configurability is commendable. Work, however, needs to be done to make it easier to use for dynamic and database-driven sites.

Josh Gliddon

ISYS Spider 1.5

■ Distributor	Odyssey Development
■ Phone	(02) 9439 5800
■ Online	http://www.isys.com.au/
■ Price	\$5,500 (requires ISYS)
■ In short	A simple solution for simple sites; database sites and documentation need work.

Avision Scan Copier DS300

In pure cost terms, a photocopy is usually the most expensive single office component — anything from \$2,000 upwards. But photocopiers still sell, because they provide instant results.

Spotting a gap in the market, US-based Avison has decided to cut out the time-wasting aspect of computer-based copying. It has designed a standard flatbed scanner that does all the usual things, but has added a custom Dialogic processor to the box which interprets the scanned image and converts it to PCL format inside the scanner itself. This amazingly obvious step means the scanner can be plugged directly into any mono, PCL-compatible printer, and will output copy directly. No need for computer connections, software, setting up, configuring or, most importantly, waiting.

The Scan Copier looks like a normal A4 flatbed scanner, with a 300 by 600dpi CCD single-pass scan head, a flip-up lid and an LCD-equipped control panel at the front. The latter differs from that of a standard

scanner, with buttons including: Reduce/Enlarge, Lighter/Darker, Paper Size, Select, Quality, and a big green Copy button.

Once the unit is connected to a suitable (not GDI) printer with a standard Centronics cable and the power supply is plugged in, it is ready to go. It can copy multiple originals directly as fast as the printer can print, after a first-print wait of about 20 seconds. The quality is good on standard setting, and on high quality both the text and tone areas are handled very well, with smooth dithering and crisp reproduction. We had no problem with compatibility on either the Hewlett-Packard or OKI printers used. The Scan Copier can also be used as a standard colour scanner by loading the supplied CD software and connecting a second port to the PC with the supplied cable.

Software includes MGI PhotoSuite 1.5, Xerox TextBridge OCR, the quirkily named Mr EasyScan TWAIN driver. A front-end utility called 'PaperCom' brings all the scanning utilities into one linked interface, so printing, faxing, emailing, OCR and image

editing can be one-touch operations. The only negative aspect was the time taken for colour scans of reasonable quality. An A4, 600dpi full-colour scan took over 10.5 minutes, and even a 200dpi A4 took over five minutes. The end result was reasonable for a 600 by 300 optical unit, with good tonal range and medium quality. But given this unit is likely to be used more as a photocopy than as a high-quality scanner, the price offers good value — especially to computer owners who already have a printer and want fast and easy copies without tying up PC and scanner time.

Jeremy Torr

Avision Scan Copier DS300

■ Distributor	Star Micronics
■ Phone	(02) 9748 4300
■ Online	http://www.avision.com/
■ Price	\$799
■ In short	Good idea, well executed and at a reasonable price, too.

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- 32X Variable EIDE CD-ROM Drive
- Standard Openview Network Node Manager S.E.
- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

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02.0006/APC/5MA

P-commerce alternatives

I was in a newsagency recently and the feature 'Porn to be rich' in the January issue of *APC* (page 33) caught my eye, so I grabbed a copy of the magazine on the spot. I'm a Webmaster of three sites: one requiring daily maintenance (news stories, etc.) that is currently bringing in \$US3,000 a month from music-related advertising; and two that are in development at the time of writing this letter. As a Webmaster of your average wholesome sort of Web site, I've always viewed porn sites as get-rich-quick schemes that are doomed to fail. It was interesting to see that there are indeed some porn sites out there run professionally, and the income is truly staggering.

My sites pay for this 18-year-old (me) to go to uni full-time (computer science degree) and there's really not a great deal of work to do . . . perhaps three hours a day. And it is hardly stressful work.

It's obvious that anyone with a bit of marketing savvy can succeed on the Internet. I still believe that just the moral issues related to porn sites should deter anyone seriously thinking about making money from the Web from starting such a site. There is a lot of money to be made from any Web site that has interesting enough content to draw a reasonably large audience.

Adam Whitehead
Internet

Telstra's double dip

This letter is to let the average user know that the price of the ISP is not the only expense related to Internet connection. With Telstra Big Pond Home's BIG150 plan at a flat rate of \$44 per month, Telstra has a great way of making money. Specifically, out of every attempt to log on to the ISP — successful or not — you are charged for it.

Take, for example, my last quarterly Internet connection bill, where I connected successfully 499 times, but my computer's attempts to connect until successful totalled 1,871 times. That means we are all billed a local call every time the computer rings out, successful or not. This seems like a complete rort.

The other thing about Telstra Big Pond is that for some reason, during the first connection of the day, the connection drops out anywhere from one to 20 minutes after connection. After reconnecting, the connection lasts until disconnected by the user, forcing one to effectively dial up at least twice every time to log on. Don't you think Telstra should pick up its game just a little bit?

George Begetis
Strathfield, NSW

Domain pain

Telstra Big Pond Business offers a number of plans under its 'Group Account' structure. These plans give you a set amount of hours' access per month and a maximum of 100 separate accounts for email which can be set up with your own domain, and I have attempted to set this up for a client.

Telstra's Web site states that you are allowed a 20-character maximum for the username. But upon trying to create these, you find that the domain is counted as part of the username, so a client with a domain name of 17 characters can only have a 3-character username. The upshot is that the cheapest option when combined with Web hosting charges is just under \$200 per month for 30 hours of something that is pretty much useless.

David Ireland
Werribee, Vic

Differing opinions

Great to see a Mac get some recognition at last in your magazine (see Best of 1998 awards, *APC* January 1999, page 62). The iMac is indeed a cool product and was the stunner for '98. Now that you've awarded it this prestigious prize, perhaps you could reward Mac users a little more often with more Mac software on the CDs?

Question: Why didn't you include Apple's 300MHz PowerBook in the comparison article on notebooks? You state in the article that the processor didn't have to be Intel (but all of them were). What gives?

Donna Benjamin
Internet

We welcome comments and suggestions. Send correspondence to *APC* Readers' Say, PO Box 37, Sydney 1028; or by email to: APC@acp.com.au.

All correspondence becomes the property of *APC* and is subject to editing.

Ed Note: We should have made it clearer in the article that machines submitted were to be IBM-compatible, ie. Intel, AMD or Cyrix. Comparing benchmark results between these and Apple machines has never been fair, because the test suites are not identical. However, we will ask Apple Australia to provide us with a PowerBook in time for our June issue notebook special, probably for inclusion as a sidebar. Meanwhile, your suggestion of more Mac software on the cover CDs has been passed on to APC's CD Editor.

Are you serious? The iMac as product of the year? I thought I was dreaming when I read this amazing decision by *APC* to award such an accolade to a computer that, on the face of it, would not cut it with most of the cheap PC clones on offer in your bargain-basement pages.

For the dubious pleasure of owning an iMac, with its dwindling inventory of software, the high price of Apple parts and not even a lousy floppy drive for backup purposes, you can fork out over \$600 more than an equivalent Intel machine. But wait, there's more: you are locked into a 15in screen, no processor upgrade and RAM can be increased to a whole 128M, so when your iMac haemorrhages under more demanding software it can be used as a paperweight. Wow!

Looking through the contenders for awards, every other product listed easily out-qualifies the iMac as Product of the Year. Unless Apple really gets its act together and produces an upgradable computer to rival top-end Intel machines at the right price, the next Product of the Year may be an invitation to the winding-up of the Apple Computer company.

Incidentally, your review of PIMs [January issue] had no mention of the father of them all, the venerable Sidekick. I have used Sidekick from the early days of DOS 3 and the latest version for Windows 98 is a real killer application.

Zigmunt Malter
Dural, NSW

Ed note: As noted above, opinions differ when it comes to the merits of the iMac. As regards Sidekick, unfortunately Starfish's new Sidekick 99 wasn't available at the time the PIM reviews were being compiled.



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In a Barbie world

Business process reengineering guru Dr Michael Hammer exhorted business not to "pave the cowpaths" in implementing technology in their workplace and work practices. I suspect the same advice should be offered to the makers of girl-software.

By Helen Dancer

To long-time readers, my fascination with Dr Michael Hammer and his erstwhile revolutionary, now familiar, theories on workplace reengineering — traditional business practice meets technology — is old news, but I crave your indulgence.

In the early days of the city of Boston, now a seat of much technology theory and practice, the burghers devised a novel way of designating which streets should be paved. If two cows could pass, the pathway was deemed wide enough to carry traffic — since in those days that's what the traffic comprised — and it was designated a 'street'. If they couldn't pass, the path was not considered a practical proposition, and so paving it represented an unnecessary expense, or, in current parlance, not a good return on investment.

Hammer adopted the phrase "paving the cowpaths" as something of a mantra in expounding his theories of business process reengineering, explaining that technology should not just be used to 'pave' or automate existing processes. Instead, he urged businesses to look at technology as a catalyst to reinvent the way they think about their business processes, rather than cementing old practices in databases and networks. Committing old processes to new technologies would never bring about the rises in business efficiency and concomitant returns on their investment in technology that companies desired, he said. And technology would get the blame.

Thoughts of Hammer came to me when I was discussing this month's feature on women in technology with Selina Mitchell. Her story had the wry working title, 'So what?', and is a valiant exploration of whether the absence of women at upper echelons of IT management and

practice is fact or fiction, if it's fiction, what drives it, and whether women are discouraged from taking up IT careers. Does it matter? we asked ourselves. Is there a social cost in one half of the population feeling explicitly excluded, or is it just an equal opportunity issue? Does it affect the way technology evolves and is implemented? And who cares, apart from the two of us? Well it turns out, plenty of people do, and I encourage you to read the results of Selina's hard work and careful research.

Brenda Aynsley, for example, suggests that the increase in the number of women in the industry is a developmental phase of the curve. Taking up an interesting insight posted to a newsgroup (Link) by Jan Whitaker, that while high fashion is (in a generalisation) a man's realm, the processes of making clothes and sewing are often left to women, Aynsley hypothesises that the increasing number of women in emerging areas, such as Web authoring, is a result of opportunities being opened up as men leave them behind to go on to the 'next big thing' rather than a tangible symptom of increasing equal opportunity. Web authoring after all, she says, can be viewed as a natural extension of typing, girls' work, according to every stereotype.

But stereotyping starts long before the workplace, sadly enough. Take a look at the relentless pursuit of little girls by the kids software end of the market, and the sorts of titles developers are producing that they claim are an ideal way of coaxing little girls onto computers.

Barbie goes shopping, Barbie hairstyles, Barbie prepares for her date with Ken, deciding what to wear by picking various outfits from her virtual

wardrobe. The Purple Moon people seem bent on equal doses of tokenism. Early product releases were bundled with coloured beads that little girls could thread together to make necklaces to wear while playing the game.

Am I the only person who finds this nauseating and counterproductive? I have had endless heated arguments with the developers and distributors of such titles. Their rebuttals involve the notion that familiarity is needed to tempt girls onto the digital express. But at heart I can't agree.

Do titles such as these really encourage girls to think beyond the square and to use the computer as a creative tool? Or are the developers doing nothing more than paving the cowpaths to a little girl's heart, and her parents' wallets, by parading the same old dolly metaphors down new silicon streets?

Will such digitisation of stereotypical pastimes encourage a new generation of computer-confident little girls ready to take their place at the cutting edge? I can't see any reason why it should. It's just another iteration of the paving the cowpaths syndrome, committing existing products to technology processes, in this case dolls to glorious technicolour multimedia, because they have proven a tremendous money-spinner in 3D.

This is not a question of the rights and wrongs of little girls playing with real dolls in the real world. Dolls are fine, dolls have a place and dolls are very popular. But the weight of Selina's research and arguments such as Whitaker's and Aynsley's are urgent evidence in my mind that software for girls, if indeed there should be such a genre, should be focused on breaking stereotypes of what girls can do, not reinforcing them. ■

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Riding out the learning curve

Have you thought about what is going to happen this year? Perhaps you are planning on building that bush cabin where you can sit out the disaster on January 1, 2000.

By Jeremy Horey

This year isn't going to be very exciting, apparently. According to the experts in *Reality Check* (the book of the column in *Wired* magazine), in 1999 we are going to see male birth control pills and overnight custom clothing.

But if you are fashion conscious, don't wait to buy your wardrobe. The experts' track record is not great. In 1998, the same book promised ecash would become a reality, a flat-rate phone service (that's long-distance, not just local) would be introduced, and the first virtual high-school class would graduate. Perhaps a virtual high-school class did graduate somewhere, but I know the other two predictions were wrong.

Microsoft product launch announcements are just as unreliable. Apparently Office 2000 is coming out sometime around the middle of this year. Based on its past performance, that means we might see Office 2000 sometime in 2000.

As far as I'm concerned, the longer the wait the better. Reading the reviews of early betas gives me that sinking feeling.

I am happy with what I have now and I don't want to change. I have found all the places where I can turn off the bits and pieces of helpful animation and clever anticipation that really irritate me. I have changed the styles so everything appears at a size I can easily read and in a font that doesn't remind me of a very old-fashioned newspaper.

I have control over all the features I use regularly in Word, Excel and PowerPoint.

Sure there are some things I find clumsy. Swapping between different documents in Word could be easier. Excel makes it easy to swap between different sheets in a workbook, and I would like to see this carried across to Word.

But I'm prepared to put up with these

less-than-ideal features for a few more years, if it means I don't have to go through that whole learning curve thing again. I will need to find all the customisation controls again so I can turn off the things I don't want.

Office 2000 isn't all bad news. It has a lot of new features, some of which sound useful. There are some things in Office 2000 that make a lot of sense for business users. For instance, the ability to set HTML (or XML) as a standard format for storing all documents is going to appeal to companies looking for a single source standard for their content. The powerful new installation features also look like a winner.

As far as I'm concerned, the longer the wait the better. Reading the reviews of early betas gives me that sinking feeling.

I'm not so sure about the Web publishing features. It reminds me of the rush to add desktop publishing features to word processors seven or eight years ago. Sure, it is useful to have layout tools in a word processor, but it is also important to know where to stop.

A word processor is not a replacement for a desktop publishing package no matter how much functionality the developer packs into it. Today Microsoft recognises this by including a desktop publisher in Office. As competing vendors tried to stick more and more layout features into their packages, they got slower and slower and bigger and bigger. Eventually they worked out how to keep the DTP features in the background for the times when you really need them rather than having them get in the way all the time. They also realised that a true DTP package treats text and

images differently. A word processor is about creating text. A DTP package is about how that text looks on a page.

Office 2000 comes with FrontPage. So does the suite need all those Web page editing features in the other products? Was it really necessary to add frames support to Word? Of course, it costs Microsoft nothing to do this. Word simply uses the component from FrontPage. But what it does do is add to the interface. Does Word need more menu options? I don't think so.

All the programs are now made up of components that can be shared. It is the skill with which these components are

organised into the different packages that makes them either easy to learn and use, or painful to learn and use. Blurring the distinctions between the programs is not useful.

Office is already big. It has features I will never use and never want. It also has features I would like and need to use, about which I know nothing. I want to be told about these features without having to cycle through every tip in the system.

But, of course, like all users, I want the program to do all the work. I want it to read my mind and find out just what I want it to do. Until Microsoft can work out a way to do this, can we please have a moratorium on upgrades?

.....
Jeremy Horey is a senior consultant with Tech Talk Australia. You can reach him at jeremyh@techtalk.com.au.

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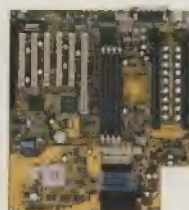
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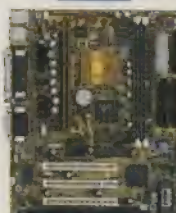
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The fall of the Roman Empire

Was it overdependence? Or just something in the water?

By Jeremy Torr

Iwalked to work the other day. No big deal, I'm lucky enough to live only a kilometre or two from my office. The curious thing was that although I do the trip quite frequently, I felt something was missing. It was . . . my briefcase. Instead of taking home the usual rummage of notes, press releases, mobile phone and personal digital assistant, I had left my case at the office the previous night.

So on this particular day I found myself with no phone, no notes, not even a packet of sandwiches. And all the way to work I had this nagging feeling I had forgotten something, even though I knew full well that everything I needed to carry on my day's work awaited me at the office. On arrival something still felt slightly wrong, as though a vital element was missing and had rendered me partially unfit for the day's work.

The experience left me wondering about the way we relate to the tools we use for our normal working tasks. It seemed as though the lack of the usual accoutrements of electronic life — whether being used or not — were things I had to have physically near me to feel comfortable. Is it possible that we have stopped using technology as a pure tool, in the way we might use a sharper knife to cut bread more effectively, and have arrived at a situation where we seek real comfort from having what, for want of a better description, might be termed 'empowering' gadgets?

Not more than five years ago, we would have thought nothing of driving interstate and telling friends we would be back in a few days or weeks. A postcard after a week was a bonus. Now, friends are likely to worry if there is no phone call within a day or so; even a mobile progress report on the

journey is not uncommon. Likewise, going to a meeting with only a diary and a notepad was more than enough. Today, unless you have some kind of combined pocket data warehouse and email-capable technosliver, you are out in the cold. And if you realise you (shudder!) forgot your mobile phone when you get to the airport, you will most likely slip into a temporary panic, even though you can't use it while you are on the plane and there will surely be card-operated payphones at your destination. The difference to your working effectiveness is most likely negligible, but simply being unable to use the technology can be really unsettling.

The same scenario often plays out in the office. We frequently relate working capability to the amount of power on our

that had traditionally been arid and inhospitable. The Romans expected clean, pure drinks wherever they went, and developed quite an art in piping, pitcher crafting and storage.

The only snag was that the Romans weren't aware that lead (the metal they used for pipes and many vessels) was a cumulative poison which results in brain cell degeneration. And although it is a bit of a long shot, some historians do mention lead poisoning in the higher levels of government as a contributing factor to the eventual implosion of the vast Roman empire. High-level decision making Roman administrators were becoming increasingly blurry and indecisive, partly thanks to the lead clogging their synapses. Now whether or not the Roman Empire

Today, unless you have some kind of combined pocket data warehouse and email-capable technosliver, you are out in the cold.

desk. Multi-megahertz, RAM-laden and multimedia-ready equipment needs to be there at our beck and call, regardless of whether we need to use it. And if it suddenly fails, distraught workers inevitably gather around to share your distress.

Remember the Roman Empire? It stretched far and wide across three continents, and was a paragon of efficiency and effectiveness, supply and demand, and socialised behaviour. (A bit like the current Net and PC-enabled, capital-driven system we all work in.) The Roman system brought civilisation to a host of countries, order to barbaric nations and a brilliantly effective system of consular government that we emulate to this day. It also brought water and food to places

would still be alive and well if lead had not been its subjects' favourite metal is open to conjecture. But there is definitely a lesson there.

Just because something is convenient and gives us reassurance in our everyday lives doesn't mean it is good for us. And if we come to rely on it too heavily, it can bite back in unexpected ways. I know one thing: if travelling without all my usual electronic apparatuses makes me feel uneasy, it's time for me to reassess how much good it is all doing me. I'm glad to say I have repeated the gadget-free trip several times now, and have survived both personally and professionally. Try it. It might give you a new perspective on the phrase 'independent thought'. ■

*Is the art of technology a cheat,
or a matter of perfecting
the craft?*

By Cathie Kennedy

Preserving core competencies



I recently attended a corporate photo shoot with a colleague. On this particular grey and overcast day in Melbourne, we were taking a picture of a grand corporate reception on the 33rd floor of a city building. The backdrop was floor-to-ceiling glass, providing spectacular views of Port Phillip Bay.

As we set up, the managing director commented on the weather, explaining how breathtaking the view was on a sunny day. My colleague didn't respond — he just made a note to drop in a blue sky complete with white fluffy clouds later.

On our return to the office, we began discussing how technology has changed the craft of photography. My colleague explained how, when he first started out as a photographer, he would spend hours, even days, waiting for the right weather conditions, or agonising over the right setup. He compared it with a recent photography shoot in a doctor's surgery, where there was an old sink in the foreground of an otherwise perfectly framed shot. Short of rearranging the whole room, there was not much that could be done physically. But digitally, well that's another story. In the reproduced version, the sink was replaced with a small stand and a vase of flowers.

One could argue — as my colleague did — that technology has allowed him even greater freedom of expression in his craft. His belief is that the skill of a good photographer is not just in their ability to seize the moment, but also in the ability to *use technology* to re-create the perfect shot.

The counter argument is that technology foils a photographer's core competency: that of capturing the emotions, energy and spirit of a moment through the

lens. According to this reasoning, photographers no longer need to be as disciplined in their approach to their work.

Of course, the same argument applies to myriad other trades — graphic designers, journalists, writers.

Consider how word processing has forever changed our written communication. In the days of longhand and typewriters, we were forced to take a disciplined approach to writing. To save hours of retyping and bottles of white-out, we would carefully craft our thoughts and the words in our mind before committing them to paper. And this often meant adopting a structured methodology, spending more time in thought to develop a clear outline before commencing.

In preparing this column on my laptop using Office 97, I will move paragraphs, and add and delete words with ease. There is less pressure to get it right first time, because with the click of the mouse I can so simply correct it on the fly or on the second read.

The impact of technology on written communication is clearly evident in our emails, both personal and professional. It has become perfectly acceptable to truncate sentences, abbreviate words, overlook correct grammar & spelling. I receive messages from a 14-year-old friend, written in email English, and I can't help but wonder if this has become his standard written communication style.

More than 10 years ago, Sushanna Zuboff spent time in a range of companies studying the impact of technology on our work and personal lives. In her book, *In the Age of the Smart Machine*, she tells of one interview conducted with a maintenance supervisor in a pulp mill. Much of the equipment at the mill had been comput-

erised, and the supervisor's job had changed from walking the floor to monitoring the status of the machinery on a computer screen.

During the interview, the gentleman questioned the capability of the next generation of maintenance supervisors. Something is wrong with this fan, for example. You may not know what; you just feel it in your feet. The sound, the tone, the volume, the vibrations. A computer can't *feel* what's going on out there. The next-generation operators will need to have more written down, because they won't know it in their guts. They'll only learn what these computers tell them.

Are we, as this would suggest, losing the context of core skills and competencies? Is technology making us less disciplined in our approach to our craft, our work, our communication? Or is it allowing us to be more expressive, more artistic and even more precise in our creations?

What is it that we find moving about a good photograph? If it is the unique point of view a photographer can bring to his or her world, does it really matter whether it is captured through the lens at the time or digitally doctored to provide a powerful image?

Are we on a precipice, trying to protect and preserve our core skills while leveraging the flexibility provided by technology?

I'd like to think we haven't fallen over the edge just yet, but we are standing dangerously close. And the next generation is possibly hurtling towards the precipice at an unstoppable speed. Whether or not it will have a positive or negative influence on our skills and our lives, only time will tell. ■



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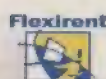
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Colour inkjets

A few years ago, you would pay absolutely top dollar for a colour printer and be happy with the rather unimpressive results. Not any more. Colour printer prices have crashed, and the major manufacturers all now offer basic models that include colour printing options.

Inkjet printer prices have also been dropped to compete with increasingly cheap laser printers. Ultimately, the choice between them comes down to use. If you're going to use a printer constantly for quick, black-and-white printing (in, say, an office), then most economy inkjets won't deliver what you're after. If, however, you're after an affordable printer with some colour printing options, then an inkjet is exactly what you should be looking for. It's also worth noting that this market is fairly well sewn up. As most retailers recommend either a Canon or Epson printer, it's definitely worth shopping around for the best price on a per-model basis. Printers are a common item, so it sometimes pays to haggle.

New models are appearing every month, so you may also be able to pick up discontinued lines for bargain-basement prices. Just ensure that the model you buy uses a standard cartridge type for that manufacturer and you should be fine. The other thing to be aware of with older models is that newer technologies such as optional scanner heads and refined, photo-quality printing may not be available — but then again, you get what you pay for.



Colour printing is within reach — we check out 12 colour printers that won't break your budget.

The last time Price Watch looked at colour inkjets was in October 1997, when colour was still a relatively expensive option. This is definitely no longer the case. Price Watch set out to find a colour inkjet printer for about \$400.

This price bracket left matters fairly open; a wide variety of models were recommended at a wide range of prices. Some retailers obviously took the request for something under \$400 as a hint that we wanted to save money, and offered older and cheaper models. Others went the other way, offering the cheapest current models at slightly higher prices. Interestingly, Adelong suggested the BJC-80, which APC first looked at in January 1998 (page 30). This is a lightweight printer (1.4kg) suitable for notebooks as well as desktops, with an optional add-on scanner head. At \$349, it is one of the best buys in this category.

Price Watch was pleased to find that this seemed to be an area of technology about which most retailers were fairly well informed. Accurate information was provided on most models, and their advantages were well presented. While some salespeople sounded as though they were reading straight from a brochure (complete

with paper rustling sounds), it was good to see that they at least had the information to pass on. The salesperson from Peripherals Plus, for example, offered us the option of a low-cost model (the Canon BJC-4310 SP) or a costlier Hewlett-Packard printer, and was able to explain why the Hewlett-Packard may be a better option for faster printing.

As colour inkjets have all but destroyed the low-cost monochrome printing market, and the prices of laser printers are pushing inkjet prices even lower, now is an excellent time to buy a colour inkjet. ■

Our charter and method

Price Watch is an exercise in comparative technologies and relative prices. All investigations are conducted anonymously, and records are kept of conversations. Prices and system capabilities printed here are provided by the sales staff at the offices we contacted, and all information is as supplied. While we assume that these are correct, we cannot accept any responsibility for errors or omissions. Neither will we be held to account by companies mentioned here for omissions to product ranges or system capabilities. The responsibility rests with sales staff to provide adequate information, as the company would expect them to do with every customer.

Company	Contact	Product	Price
Adelong	http://www.adelong.com.au/ (02) 9267 5272	Canon BJC-80 Epson Stylus Color 440 Epson Stylus Color 640	\$349 \$259 \$345
CCC	(02) 9232 4500	Epson Stylus Color 640	\$349
Computer Market Online	http://compute8.over.to/	Epson Stylus Color 440 Epson Stylus Color 640 Canon BJC-4310	\$235 \$320 \$340
Dick Smith Electronics	http://www.dse.com.au/ 1 300 366 644	Canon BJC-255 SP	\$199
John Maggs Computers	(02) 9231 6464	Canon BJC-4310 SP	\$279
MVB Computer Supplies	(03) 9725 6255	Epson Stylus Color 640	\$390
Peripherals Plus	(02) 9630 3166	Canon BJC-4310SP Hewlett-Packard (Deskjet) 710C	\$275 \$399

What should you do if someone fraudulently accesses your Internet account? **By Roulla Yiacoymi**

Not on my account

You examine your ISP billing statement and stare in disbelief. Did you really rack up \$195 in charges? You start looking at the itemised calls. You know you couldn't possibly have stayed connected for six hours in one sitting. And what are all those charges incurred over that weekend you were out of town?

If you suspect something suspicious about your ISP billing, immediately call your ISP and ask them to investigate. If you don't get a satisfactory answer, cancel your account. Next, if your ISP payments are automatically deducted from a credit card, cancel the card. Report the matter to the police and inform the Telecommunications Industry Ombudsman.

Finally, it's important to check that your machine is secure. Ensure you have the latest update of your preferred antivirus application, capable of detecting Trojan horses such as Back Orifice. These programs can be used to act as a remote administration tool, providing control of your machine to a remote operator anywhere on the Net. It makes accessing your passwords and reading personal email without your knowledge child's play. You wouldn't even be aware that the program is present — it can run invisibly on Windows 95 and 98 machines.

Dear APC,

The purpose of this letter is to make you aware of two things. The first is that my Internet account was illegally used over a period of approximately a week, following what appears to be a hack conducted against my computer to remove my dialler information. The second is to make you aware of the appalling treatment I received from my ISP, Telstra Big Pond Home.

In October 1998, I received a bill for \$450. My normal monthly bill has rarely exceeded \$50. When I examined all of the bills together, I discovered that some of the logins were simultaneous, and many occurred while I was either at work, not at home, or asleep.

I contacted Big Pond. The customer service rep suggested perhaps I had left my modem connected. This is not possible, as the phone is my only phone, and I also use it for normal calls.

After doing some checks, Big Pond informed me my account had been accessed from POPs in both Brisbane and South Australia, and asked if I had given my account details to anybody in those locations — I had not. The rep stated that it appeared to be a case of fraud, and that I should notify my bank (for credit card purposes) and the Northern Territory Police of the illegal use of my account. I was told that if a police investigation concluded it was criminal activity, I would be reimbursed. I immediately cancelled my credit card and went to the NT Police at Palmerston.

Later that night, my partner, who is also a Big Pond user, downloaded her email and received a statement for \$95, which was well in excess of her normal bill of approximately \$20. Again, the statement showed repeated and multiple logins — one was for over 10 hours.

A Big Pond check showed that this account had been accessed from Canberra and Brisbane. Again, she had not given her details to anybody. The representative stated that we should report the matter to the police, and email all details to Big Pond. Once again, credit cards were cancelled, and we reported this matter to Palmerston police. A Statutory Declaration was taken at this time.

That night, I sent the email to Telstra, as instructed. I included all that I knew and suspected, and asked that they let me know when I was likely to get my money back, as well as what precautions could be taken in the future. I also contacted the Telecommunications Industry Ombudsman.

My partner received another statement for \$80, after informing Telstra of the problem. Again we called, and again they "made a note of it".

Ten days after sending my email, I still had not heard from Big Pond, despite repeated attempts to contact someone. I believe that in too many instances organisations like Telstra forget about the little people, even though we make up a large part of their customer base.

The time and money I have spent pursuing this, as well as the \$500 plus my partner and I are out of pocket, almost paled into insignificance by the treatment I have received from what should

be an excellent ISP. A local ISP in Darwin has since picked up our business.
Matthew Kitchin
Palmerston, NT

Dear APC,

Matthew Kitchin contacted Telstra Big Pond Home's Billing Helpdesk on October 12, 1998 advising us that his account had been accessed fraudulently. Our helpdesk conducted preliminary investigations and advised him that there were connections on his Internet account originating from Adelaide and Brisbane. The helpdesk informed him that Telstra Big Pond Home validly charged his Internet account. If, however, he believed his password was compromised and his Internet account accessed fraudulently, he was advised to contact his local police service.

On October 18, Matthew called the helpdesk to close his Internet account and to inform us that he had contacted the Northern Territory police. The following day, we advised him that we were unable to refund any charges and reiterated that we would assist the police in their investigations.

In situations such as this, Telstra Big Pond Home does not refund any charges. We advise the customer to contact the police to report the incident. The police throughout Australia have been extremely cooperative and will assist the complainant even though some may be unfamiliar with Internet technology.

Telstra Big Pond Home has been proactive in providing customers with information on Internet fraud and methods to protect their Internet account. Information about Internet security can be found on the Big Pond Home home page. We have also worked closely with the police on this matter.

The issue of fraud is a serious concern. Internet fraud occurs not only at Telstra Big Pond Home but also at other ISPs. Telstra Big Pond Home cannot be held liable if customers do not secure their personal computers and passwords.

Adrienne Tan, Billings Manager
Telstra Big Pond Home

In January, Matthew informed Service & Reliability that all the fraudulently incurred charges had been refunded by his credit card provider.

Has your Internet account ever been compromised? Let me know, at ry@acp.com.au.

Are we encouraging primary and secondary teachers to integrate learning technologies into the classroom?

Technology in the classroom

In what is believed to be the world's second-largest laptop computer tender, the Victorian Department of Education launched a program late last year to distribute 37,000 laptops to teachers across the state over a five-year period. It has been reported that a quarter of these have already been issued. Training material, including approximately 10,000 self-paced learning CDs, has also been distributed.

To receive a notebook, teachers must agree to use the equipment for work purposes and to undertake 40 hours of professional development within 12 months, regardless of their computing experience.

A Department of Education spokesperson told *APC* that the initiative is part of a larger scheme by the department to encourage teachers to develop skills in learning technologies.

"The Department of Education's range of services is both proactive and extensive when it comes to providing educators with professional information technology development," he said. "We will spend \$56 million over four years in IT teacher training."

The department has also set up a Web site that provides teachers with ideas on how to incorporate computers and information technology into the classroom.

And not before time. While those teaching computing subjects at VCE (senior secondary school) level typically have an appropriate qualification or training — at least two years of a computer science undergraduate degree — *APC* has found that many teachers taking classes up to Year 10 have no prior experience in either using computer technology or integrating learning technologies into the curriculum. In many cases, teachers are only just managing to stay ahead of the students, many of whom by the age of 12 or 13 are already competent in using office automation software, and are developing their own personal home pages, experimenting with multimedia, and dabbling in programming.

Universities have wised up to this loophole in the education system, and have begun to introduce specific teacher training to address the issue. For example, as part of the Framework for Accred-



ited Teacher Professional Development introduced by the Victorian Professional Development Network, eight Melbourne universities offer courses that grant credit towards a Graduate Certificate of Education. Within the information technology stream, teachers can select subjects that cover computer programming for education, multimedia, software tools, telecommunications, using the Web for teaching, and various learning technologies in education. Similar programs exist in other states.

In addition, many universities and professional associations such as the Australian Computer Society run summer workshops in computer skills for primary and secondary school teachers around Australia.

Universities, state governments and professional associations are investing big dollars and substantial resources, but it seems teachers in both the private and public sphere are still floundering.

Paul Nicholson, lecturer in Computer Education at Melbourne's Deakin University, agrees. "Our experience is that there is a large number of teachers in schools with minimal information technology competencies, despite the opportunities available," he said.

Nicholson has identified one key reason for this: many teachers, partly as a result of the aging profile of the profession, aren't convinced of the value of information technology in education.

"Most of the teachers who are hesitant to use technology inherently don't believe in its value for education purposes. They haven't been faced with a compelling argument as to why they should invest in this change," he said.

Nicholson admitted that teachers are under increasing pressures and already contribute substantial hours out of school time, but he believes they need to make a conscious effort to tap into the resources available.

"It can't be blamed on employer, government or educational institution neglect; it's more the profession in general that isn't convinced," he said.

At Deakin University, many education studies major units are now being delivered electronically, so students assimilate computer technology rather than "use the technology as an artefact, as magic", according to Nicholson, who believes in encouraging learning through use.

However, there still appears to be some new graduates slipping through the cracks. *APC* spoke to a recent Bachelor of Education graduate from the Australian Catholic University who asked not to be named. She has just been offered a position at a private school teaching arts and multimedia, yet she admitted she has no computing skills.

"We were offered one computing unit as part of our course, but it covered basic word processing," she said. "Technology was simply not offered as an area of specialisation, nor was it made available as a learning tool."

With an estimated 70,000 computers in Victorian schools alone, there is an urgent need for teachers to improve their skills in the application of information technologies to teaching methods, the curriculum, and the learning experience of students. This concerns not only the teaching of specific computing subjects, but also the integration of technologies in the classroom generally.

Cathie Kennedy

Traditional modes of business have survived and prospered since the introduction of the Web.

Second-wave evolutionaries

One thing the first generation of hot Internet stocks has done is disprove an early theory about how the World Wide Web would change commercial transactions.

Specifically, disintermediation has simply not happened. Rather, the hot stocks are new intermediaries.

Do we buy books on the Net direct from publishing houses, or electronically from authors? No, we enthusiastically rush to Amazon.com, making it one of the most recognisable brand names in the world. Its shares listed at \$US9 in May 1997, and are trading well above \$US130 in yet another post-holiday surge.

How do we find buyers for second-hand goods, one of the few types of one-to-one transactions in the physical world where we do not always use an intermediary? We go to eBay or uBid, and use an online auction house rather than holding our own online garage sale. In its first four days of trading, uBid's share price climbed from \$US40 to \$US188, and eBay has seen its share price soar from \$US25 to a high of \$US311, and it is consistently above \$US280.

How do we respond to the exciting prospect of exploring an uncharted online world? We turn to Yahoo, which has changed from being a search engine designed to help us navigate the new world into a portal, a safe harbour where we hope to find all we need. Hovering at below \$US40 a year ago, Yahoo stock is now trading above \$US280.

All of this suggests that we online consumers behave in ways that are surprisingly similar to the way we behave offline, and the companies that have leveraged that behaviour into businesses have been the stock market winners.

There are two forces gathering strength now that suggest online intermediation could be entering a new era. And that has important implications for the types of companies that will be the next generation of winning Internet stocks, especially in retail markets.

First, there is change at the supply end among the old intermediaries. According to Howard Anderson, the president of market research and consultancy firm the Yankee Group, Fortune 500 companies



are in the starting blocks to race into ecommerce over the next year. Sorting out their Y2K problems over the past 18 months required these companies to build a bridge between their information technology operating divisions and their business strategy and marketing divisions, Anderson said.

Traditionally, he said, IT&T divisions communicated with marketing and strategy divisions "mainly by rumour", with neither understanding nor respecting the other. Confronting Y2K has forced the divisions to get beyond those problems to fight a common enemy.

Anderson said these companies are now looking to take further advantage of that bridge, and electronic commerce — both business to business and retail — might well be where they turn their attention.

The second force is coming from the demand end, and could well play into the hands of the retailing giants just as they move their attention to the Net. Cyberspace is no longer the realm of geeks or even semi-geeks. Online retail marketing strategies are increasingly dominated by the concerns of the so-called 'post-early adopters' — a fancy name for ordinary folks. These people are not drawn to purchase things on the Net by the novelty of the technology. They are looking for price,

convenience and service, the same values they look for offline.

How do you reach these consumers? Probably through traditional advertising techniques: television, print, billboards. All of which cost big bucks, if you are building a brand from scratch.

And their greatest concern about buying online? Security. So expect them to look for brands that they know and trust.

For an idea of what these two trends mean, take a look at Barnes & Noble's come-from-behind marketing strategy to take on Amazon. For a start, it has an annual marketing budget of \$US25 million. There is also the subliminal Godzilla message employed in the company's advertising campaign — size does matter. More books, more distribution points, more experience. In other words, you know us, you can trust us.

Other interesting online retailing battles emerging suggest that the big issue on the Net might be whether offline intermediaries have more robust brands than manufacturers, which are still looking for an opportunity for disintermediation. For example, US department store giant Macy's carries Levi's jeans in its shops, but does not sell them through its recently launched Net store. The reason? Levi Strauss launched its own online store about the same time Macy's went online.

The Amazon versus Barnes & Noble struggle for online supremacy is one thing. Amazon has had such a head start, and has so captured the public imagination by showing what could be done on the Net, that its brand is arguably one of the leaders in the world already. But would you back a start-up Jeans.com that proposed leaping into the fray against such heavyweights as Levi Strauss and Macy's? Indeed, if you had a choice of buying from any one of the three, bearing in mind the financial power and potential discounting capacity of Levi Strauss and Macy's, where do you think your money would go?

So, in 1999, cast a discerning eye over the Internet initial public offerings. Apart from the frenzied chase of stag profits, look for boring old Fortune 500s that suddenly start getting it right.

David Forman



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Australian copyright law has some catching up to do.

Making copyright right

The current Australian copyright regime causes two significant problems for programmers and software developers. As Australian law stands, in commercial contexts there are very limited exceptions to copyright with respect to copying for the purpose of error correction or for achieving interoperability by reverse engineering.

This situation is a potential cause of inefficiency in the Australian IT industry, because of the time it takes developers and programmers to obtain authorisation from copyright holders. However, such a broad-ranging copyright (which in general is strictly enforced by Australian courts) appears to have no obvious social, moral or economic justification, and leaves Australia out of step with copyright law in the US and the EU as we march into the new millennium.

An example of the importance of error correction exceptions to copyright has recently emerged in the context of the Y2K bug. Many industries are struggling to meet Y2K deadlines. The time needed to obtain copyright clearance from a third party which holds the rights to defective software may prolong Y2K problems. This means that many businesses which have identified a Y2K problem and have the resources to fix it, cannot legally do so unless copyright clearance is obtained.

Deacons Graham & James has made submissions to Senator Alston's Y2K Project Office requesting that the Federal Government consider amending the Copyright Act so that anyone copying software for error correction is deemed not to infringe copyright.

This particular amendment could be modelled on Article 5.1 of the *EU Directive on the Legal Protection of Computer Programs*, which provides that copying "in the absence of specific contractual provisions . . . shall not require authorization by the rightholder where they are necessary for the use of the computer program by the lawful acquirer in accordance with its intended purpose, including for error correction".

An alternative to the introduction of a general provision such as Article 5.1 would be to introduce a specific defence to copy-



right infringement if the infringing conduct occurred as part of a Y2K program. Such a provision could be transitional in nature to cover work done in relation to key dates such as September 9, 1999, January 1, 2000 and February 29, 2000.

Either of these options would provide the industry with more time in which to fix Y2K problems. They would lower the level of risk faced by IT remediation specialists, who are almost always unable to obtain insurance.

The EU has also shown leadership in the provision of a copyright exception when reverse engineering is performed to achieve interoperability. Under Article 6 of the directive, a copyright clearance is not required "where reproduction of the code and translation of its form . . . are indispensable to obtain the information necessary to achieve the interoperability of an independently created computer program with other programs".

To benefit from the protection under Article 6, developers must ensure that reverse engineering is restricted to the parts of the original program that are necessary to achieve interoperability. Also, the information obtained generally cannot be used for any other purpose and must not be readily available from other sources. These conditions strike an appropriate balance between the interests of copyright holders and independent developers.

If copyright exceptions for error cor-

rection and reverse engineering were introduced into the Copyright Act, Australian law would be in step with the EU and the US. "Similar recommendations were contained in the Copyright Law Review Committee's 1995 report," confirmed Anne Fitzgerald, a former member of the CLRC Expert Group, and now a technology lawyer at Software Engineering Australia. Indeed, the US appears to have followed the CLRC's lead, because the provisions of the recent Digital Millennium Copyright Act share some similarities with the recommendations made in the CLRC's 1995 report. We now have to wait and see whether the CLRC's recommendations are implemented in Australia.

In the meantime, error correction and reverse engineering exceptions to copyright will continue to be hot topics. And for good reason. The past 50 years have shown us that error-free software programs are the exception rather than the rule. The ever-expanding IT frontier arguably makes it necessary for the law to arm software developers conducting reverse engineering with defences to copyright infringement while affording adequate protection of the interests of copyright holders.

Leif Gamertsfelder

Links

- For the full text of the Council Directive of May 14, 1991 on the legal protection of computer programs (91/250/EEC), visit <http://www2.echo.lu/legal/en/ipr/software/software.html>.
- For the full text of the CLRC's 1995 report on interoperability visit <http://www.agps.gov.au/customer/agd/clrc/clrc/sware/index.html>.
- For the full text of the CLRC's 1998 report on fair dealing visit <http://www.agps.gov.au/customer/agd/clrc/clrc%20report/ReportHeadings1.html>.
- For a summary of the US Digital Millennium Copyright Act visit <http://lcweb.loc.gov/copyright/>.

Research suggests that two years on, the AMA has helped reduce the total cost of ownership for corporate PCs.

Cost cutting

Cast your mind back to October 1996. Network Computer hype was at its zenith. That was the month Oracle chief executive Larry Ellison launched the company's Network Computing Architecture. The world salivated at the prospect of \$US500 NCs, while research companies were demonstrating that the total cost of ownership (TCO) of corporate PCs was stratospheric. For instance, Gartner Group published a report which for the first time put a figure on the annual TCO of a typical corporate PC (about \$US9,000).

If your business was about selling as many PCs as possible, the long-term prospects were looking decidedly grim.

In the same month, Intel and IBM launched the Advanced Manageability Alliance (AMA) to attack the TCO issue. Andy Grove had already gone on record as saying it was Intel's aim to reduce TCO by 15% during 1997. The AMA grew out of Intel's LANdesk technology and Wired for Management (WfM) initiative, and IBM's research into the area of PC management.

LANdesk enabled OSes and other software for new PC installations and upgrades to be remotely configured. The purpose of WfM was to improve PC management in order to reduce the TCO of business computing, including costs for system management and support. Intel made a number of promises: to introduce new hardware and software products, to undertake joint work with other companies, to develop industry standards and other programs to target reductions in expensive manual intervention in network management.

Two years on, it's a good time to have a look at what the AMA achieved.

Intel's initial input was its desktop management and networking technology experience, while IBM brought its knowledge of PCs and networked systems to the table.

Intel decided to take the work it had done for the Desktop Management Task Force (DMTF) and add some complementary technologies, in order to fully standardise desktop PC management. But users also needed to remotely configure, diagnose and asset-manage PCs.

The first task was to tackle remote wake-up of a PC. IBM produced Wake on LAN. It enabled devices that were asleep on a network to respond to ping checks with a

pong, as well as await a magic packet to wake them up. Wake on LAN's remote-management capability was incorporated into Intel's Fast Ethernet LAN adapters and LANdesk Client Manager software.

IBM brought out a LAN adapter with these features in early 1997. Intel released its EtherExpress Pro/100 Fast Ethernet adapter in August 1997, incorporating its 82557 and 82555 Fast Ethernet controllers and the new management capabilities. It was designed for use by PC OEMs in both adapter and LAN-on-motherboard designs.

The Intel EtherExpress PRO/100+ single chip adapter was released in the following month. Intel claimed this 82558 adapter was the first Fast Ethernet solution to integrate four adapter functions into a single

Core Corporation and Lightwell carried out research for Intel and IBM that has shown the AMA's efforts are reducing TCO.

chip; reducing the number of parts improved overall reliability. It was also the first to support the Advanced Configuration and Power Interface (ACPI).

As well as being a product of the AMA, Wake on LAN is also described by Intel as an integral component of the WfM baseline specification for Remote Wake-up. Wake on LAN works with systems management applications such as Intel's own LANdesk, Tivoli's TME 10, Computer Associates' Unicenter and Hewlett-Packard's OpenView. It enables network managers to remotely perform services such as software updates and virus scans out of office hours.

Numerous PC vendors now offer machines with Wake on LAN built in. The list includes Compaq, Dell, Toshiba and NEC, although it excludes Hewlett-Packard, which prefers its own home-grown technology. Intel's figures record that over 20 PC manufacturers are shipping business systems featuring Wake on LAN capability, and that it has sold more than 2 million Wake on LAN connections.

Wake on LAN was followed by Alert on LAN. Released in April this year, Alert on LAN was designed to alert network administrators to a PC fault, even if it's switched off or the operating system is unavailable.

IBM is currently the only vendor sup-

plying Alert on LAN-capable PCs, but Acer, ASUSTek, Fujitsu Japan, Gateway and Siemens Nixdorf have plans to include it in future systems. Alert on LAN Version 1 is available on a number of Intel chips, and Version 2 will be on Intel's Ethernet chips when it is released in May next year.

And what about the latest release from the AMA, the Universal Management Agent (UMA), which appeared in July. UMA enables client data from PCs to be received and understood by different vendors' management applications operating in the same network, including Tivoli's NetView, Microsoft's SMS, Intel's LANdesk Management Suite and IBM's Netfinity Manager. The agent sends vital client information from IBM and non-IBM systems to

these enterprise-level management products for analysis, notification and repair.


Two companies, Core Corporation and Lightwell, carried out research for Intel and IBM that has shown the AMA's efforts are reducing TCO. They studied a financial firm and a manufacturer respectively. The total life cycle of a PC was recorded, including new PC installations, upgrading functions, troubleshooting, and removal from service.

The financial firm estimated the annual TCO reduction would be 32%, and the manufacturing firm estimated 31%. The companies used Wake on LAN and IBM's LANClient Control Manager (LCCM) with WfM-enabled hardware. Both firms showed a reduction of over 70% in the cost of installation and configuration, and well over 80% in upgrading software.

Gartner Group's latest calculations also indicate that systems management can reduce desktop TCO by up to 10%. For servers and networks, systems management can reduce TCO by up to 20%.

As for the future, no specific details of upcoming AMA products are available, although a Token Ring-enabled version of Alert on LAN is due. An announcement on Alert 2.0 should follow. New incarnations of UMA are expected sometime this year.

John Sterlicchi



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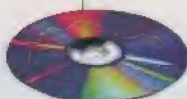
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Visit to the cybershrink

Dan Tebbutt reclines on the couch of Sherry Turkle, an American academic renowned as the Internet's leading psychologist.

Making contact with people who share similar interests is one of the great joys of the Internet. The global network provides a path to connect every taste, titillation and perversion with like minds. The seething cauldron known as cyberspace reflects everything good and bad about humanity — something often lost on media sensationalists who blame the Net for causing social ills, such as the recent letter bombings in Australia.

Yet even within the context of this online doppel-

gänger hunt, it would be pretty odd to come across someone who seemed to match your personality entirely. Especially if they happened to share the same name and work in the same particular field. This rather eerie experience confronted Dr Sherry Turkle a few years ago when she logged onto her favourite community and found someone named 'Dr Sherry' handing out psychology questionnaires. As a widely renowned academic psychologist specialising in the study of the social impact of computing, Turkle had some cause for surprise. But instead of getting angry, the Massachusetts Institute of Technology professor started relating the experience to her own theories about role-playing in cyberspace.

"The ability to go online in virtual communities, chats and other different contexts and to play out aspects of self is a very important aspect of how life on the screen works," Turkle told APC in her Boston office. Nevertheless, learning that one's online persona could be hijacked by a group of psychology undergraduates was fairly disorienting. The shock was magnified when she considered the potential to marry a personality with some kind of artificial intelligence or box software.

"For me the Dr Sherry experience is part of a larger story where you could go online and the entities you speak with could be programs," she said. "The idea that you might meet an entity online that could be a non-human is a dramatic change in how we think about ourselves. We might have social intercourse with objects — that will be a tremendous cultural shift."

Networked personality

Turkle's reputation as the leading psychologist of the digital age came from two influential books that catalogued her observations about human interaction with computers. She shot to prominence in 1984 with *The Second Self: Computers and the Human Spirit*, a book most widely noticed for its pioneering revelations about cybersex and the frequent habit of men adopting female personalities online. A follow-up work in 1995, *Life on the Screen: Identity in the Age of the Internet*, looked at how computers and the Internet were reshaping human identity as people

explore the complex array of hats they wear in the wired age.

Turkle feels the ability to express different aspects of the self through computers creates important psychological benefits. Computers give us an increased ability to play with aspects of our identity that may be otherwise under-represented. Exercising this freedom is a reaction to the serious, work-oriented nature of modern life, she said, comparing online experimentation to the developmental liberty available during adolescence. "The spaces for that kind of playfulness are really closed down in our society, so people are using the Net to open up space again," she said.

Unfortunately, people who do not understand this new sociological need tended to impose a rigid distinction between online behaviour and physical-world behaviour. Turkle rejects the notion of fixed boundaries, and instead sees a continuum between the cybernetic and the tangible. "As more and more of people's life experience takes place on the screen, we don't want to denigrate that by just calling it 'the virtual' versus 'the real'," she argued. "The virtual and the physical are joining together to make a new 'real'. We need to respect that people's experiences online are real in their own way."

Identity in the Internet age will become inherently more complex as children grow up juggling multiple digital personas. "The Net allows you to cycle through different aspects of your personality with each one happening in a different window. In this metaphor, multiple windows correspond to different aspects of the self," explained Turkle. "Life on the network encourages a model of self that is diffuse, multiple and heterogeneous."

This 'decentring' experience was Turkle's primary focus in *Life on the Screen*. Since the book came out, however, she has perceived "something of a backlash" as contemporary adults struggle to accommodate the dexterity of identity demanded by the Internet. "In everyday experience, people have one body and feel the need to take



responsibility for it," she said. "An online experience where you have many selves acting in many different places can undermine the sense of the one who needs to take responsibility. As people have increasing experience with a distributed self, they start to pull back and define the core self."

"This double movement — a decentred identity and a recentred identity — is a very old story in the history of theories of mind." She said the debate over the nature of identity would continue as an information age extension of classic differences between Freudian and ego-oriented psychologists. "The way computer metaphors act on people now produces the same paradoxical effects: at the same time as you have powerful distributed models of mind, you [also] have people's experience online and the desire to pull back and discover 'the real me'."

Dark side of the Net

Populist cynics often dismiss Internet communities as a bunch of starry-eyed dreamers playing out frustrated fantasies. Such perceptions raise Turkle's ire. "Your choice of fantasy says quite a lot about you," she said. "So when people go online and play out their 'fantasies', I'm not convinced they are not expressing the deepest truths about themselves. The trouble with the word fantasy is that it's too often used to denigrate an aspect of self as less real."

"The reason we get these 'double personality' stories is that we have a unitary model of personality," she continued. "So double personality becomes frightening — a kind of dark side. But if you think of the personality as inherently multifaceted, the story of self-deception is less clear. The question is becoming more complicated, because you could say it's not self-deception, it is allowing more aspects of self to come out. I lean towards a model of personality where there is a lot more representation of various selves than you would normally think of. I am not thinking about multiple personality disorder at all, where a part of the self is hidden from the rest. I am talking about the opposite — where people have opportunities to let more of themselves out. At the moment the balance is towards a celebration and rediscovery of playfulness."

Nevertheless, she concedes that some people could do more harm than good by acting out the same old stories and reinforcing negative patterns. "When they do that, they end up not working through problems in a constructive sense. One thing I say in *Life on the Screen* is that if you push this to an extreme, the implications are dramatic," Turkle said. "The fact that this can happen does not mean there is not also positive potential in the activity. The people who do the best in their lives on the screen are those who approach it with a spirit of self-reflection."

Since the book's release in 1995, Turkle has continued to put her theories into a wider context. The tension between personal privacy and public personality will continue long into the information age. "This double movement is happening in the culture as a whole: everyone wants to go on Oprah and tell all to complete strangers, but on the other hand people are paranoid about their realm of privacy," she said. "Both things are happening at once. The computer isn't solely responsible for that, but it has played a role."

Tamagotchi generation

In recent years, Turkle's interests have broadened further. One new technology that fascinates her is Tamagotchi, the Japanese-made virtual pet that took the under-age world by storm. This artificial life form presented her with a wonderful opportunity to research the sociology of human/machine interaction. She found that children bonded with Tamagotchi more profoundly than dolls, for instance, because the virtual pets responded to their custodians personally. "Tamagotchi teaches that what we used to think of as the

inanimate world is there to be nurtured," she said. "These toys play back and present your behaviour as consequential in their life."

The experience reminded Turkle how computers "bring philosophy down to earth". "Forget about theories of artificial intelligence or artificial life," she said. "Day-to-day experiences with computers raise philosophical issues in a very concrete form. The computer is a space where you project something that can exist almost autonomously as your agent."

At this stage, though, our understanding of the impact of computers and the Internet is fairly rudimentary, according to Turkle. "We don't have the social practices to think about a lot of things [to do with] computers," she told APC. "We are just beginning to see the psychological, moral and political consequences of the shadow self. People's sense of privacy and where their self is located becomes very distorted online."

The education system is one area in which our immature attitudes towards computers are exposed, Turkle suggested. Too often PCs are regarded as a cheap substitute for good teachers. "Right now people are still excited about the idea that you can solve educational problems by dropping the Internet on them," she said. "This will not happen... and there will be a tremendous letdown in education." Networked computers are very good at providing information, but Turkle argues they do little to foster the basic skills of logic and reason.

Overemphasis on computers in education could, ironically, mean that future generations understand how to use a PC but lack the knowledge to program one. "Are we creating a generation of grazers? Are we creating a generation of people who don't know how to analyse the primary materials they are using to think with? Equally sad, are we creating a generation that doesn't know how to think about media?" asked Turkle. "I am very con-

"Life on the network encourages a model of self that is diffuse, multiple and heterogeneous."

cerned about the ability to form complex and multifaceted yet coherent arguments. I am also concerned about a related issue of readership skills for culture assimilation," she added. "Our schools aren't particularly focused on creating those skills."

A similar dose of reality is needed for people who think online community can replace all our current physical institutions. "The way people live, they don't want to make the kind of real-versus-virtual distinction that the media has hyped," Turkle suggested. "The desire to connect physically, face-to-face with people, is tremendous. People's need for local communication is so great that increasingly the emphasis is shifting to using the Net for local rather than global outreach. We don't give enough credit to the fact that we have abandoned so many of the social institutions that used to bring us together." ■



The IT industry is full of men So what?

BY SELINA MITCHELL



What does it take to get more women interested in technology, and does IT really need them?

Research indicates that the majority of school-age girls aren't interested in using technology, and most don't even know what IT work entails. Relatively few women are embarking on or involved in lucrative technology-related careers. Many believe this is an uneducated mistake rather than an informed choice, and they are keen to redress the imbalance.

According to the Australian Bureau of Statistics (ABS), only 20% of IT professionals are women. Of those IT workers earning \$80,000 or more, women represent less than 1%, said organiser of Females in Information Technology and director of Technology Solutions, Ann Moffatt.

The situation does not appear to be about to change: most universities and TAFEs quote female participation rates of about 20%, and some are finding the rates are declining. Women do make up a more representative percentage of basic courses, but as the level of difficulty increases, the number of women taking the courses decreases. Also, those undertaking degrees tend to opt for the 'softer' courses that involve less hard-core programming, and have more of a business design and analysis focus, said Vivienne Price, author of a new report, *Information Technology: Windows of Opportunity for Women*, commissioned by the Information Technology Industry Training Advisory Board.

Some say this is evidence of the innate differences between men and women, and that nothing is stopping women from participating in the industry — they just don't want to. However, many others disagree.

"It's no good telling someone at 19 that being a technically-oriented female is a really attractive proposition if she's [been hearing the opposite all her life]," said Kate

Lance, system manager at Internet service provider Connect. "To bring more women into fields where their skills are necessary, after a lifetime of negative messages, demands remedial action, not just a bland assumption that they have the 'opportunity' and they're just not taking advantage of it."

Not only are women less likely to participate in the development of IT, but they are also less likely to use technology, although they are beginning to catch up. ABS statistics show that about 35% of men and 27% of women accessed the Internet in the 12 months prior to August last year. Only 20% of those who purchased goods or services via the Net were women.

Computer use is a relatively low-ranked leisure activity among both sexes. A 1997 ABS survey, *How Australians Use Their Time*, found that 8% of Australian men spend some leisure time on PCs, either to play games or for general hobbyist fun. Only 4% of women said they did the same.

The number of women online is slowly increasing, however. Figures from *www.consult* show that 60% of all Internet users and 70% of regular users are male. Two years ago, 85% of regular Net users were male.

IT is not completely a man's world. Women have been involved in IT careers since computers were first introduced, but it seems their numbers tapered off as the industry developed, Moffatt said. It was a group of six US women that programmed ENIAC, the first all-electronic digital computer, in 1945, and the pioneer of Cobol was a woman, Grace Hopper.

Why oh why

Like the IT skills shortage, the dearth of women taking up IT careers is not an issue in Australia alone. The number of women entering the British IT industry fell to 24% in 1998, from 30% in 1994, a December

conference on Women in IT was told. In the US, the percentage of female computer science graduates fell almost 10% in a year, according to the US Department of Education. The Association for Computing Machinery's committee on Women and Computing has announced it will launch a year-long study into why so few American women are taking computer degrees.

Women already enjoying careers in the IT industry are perplexed. "This is one area where I fail to see why it is male-dominated," said Professor Joan Cooper, head of the school Information Technology and Computer Science at the University of Wollongong. "IT is not about sitting in a back room codecutting any more. IT workers need extremely good communication skills and need to work very closely with users."

There are still propeller heads in the industry and there will always be a need for them, but job opportunities for other types of work are increasing, APC was told.

Research shows young women are not convinced. They commonly perceive IT as a man's world and don't really want to be a part of the gung-ho, go get 'em aggression which they think is involved. It doesn't suit young women's style of work, nor their aspirations of combining work and family commitments; and basically, they believe technology is a geeky and boring industry.

In researching *Information Technology: Windows of Opportunity for Women*, Price found that young women in years 11 and 12 had strong views about technology, although most admitted they didn't know much about the industry. "They feel it is nerdy, and [that it is] a job for boys," she said. A large majority had no desire to enter the industry, but they did not know what type of jobs were available in the IT sector, she added.

The 1998 University Teacher of the Year, Professor Angela Carbone from the

ALP Senator Kate Lundy, shadow minister assisting on IT

Wow: a politician, a young attractive woman, and she understands technology. How quaint.

That reaction is a common one to Senator Kate Lundy, her staff say. For Lundy, the surprise with which her skills and interests are met is probably nothing new. She



has easily and successfully moved from one male-dominated field to another, and built an interest in yet one more.

Lundy's interest in computers was not developed at school, however. "I just wasn't interested," she said. "Mind you, they

weren't exactly thrilling then. We had an Apple IIc at home and that sat in the corner. We just thought it was really boring and stupid."

Lundy left school halfway through year 11 to become a builder's labourer. Three years later, she began a job with a trade union after deciding there was no future in removing asbestos. She had taken a receptionist's course and learnt to type. When the union bought a computer, the typing finally came in handy, as the PC ended up on her desk. Lundy familiarised herself with the software and hardware, and became so enthusiastic and skilled that when a LAN was installed, she was involved in its planning and implementation. From there, she moved on to desktop publishing, and transferred her skills to basic markup.

"Access and equity [to technology] from that stage stuck in my mind," said Lundy. Then came preselection and a seat in Parliament.

"I've tried really hard to retain my practical skills. They don't actually supply computers for senators and members, only for staff. So one of the first things I had to do was purchase a computer and install my own Internet connection," she said.

"I thought I would join in on the debate on IT, but found that basically there wasn't any, and that the Coalition

frontbench was devoid of a vision of what the Net had to offer culturally and socially. It just didn't form part of their political landscape. For the first year I spoke a lot about the Internet, IT, the future and R&D in Parliament.

"As a woman working in the sector, you always feel like there is a bit of a test thing happening — there is no assumption that you are across it. I think women actively have to establish their credibility, whereas with men it's assumed in the first instance. The only way of overcoming this hurdle is to pass the 'test'," Lundy said.

"It is about having confidence in what you're involved in. I have never had a technical background and my perspective comes far more from the social implications perspective of IT, but I feel confident talking the language. I got over being intimidated by the technicality of the jargon in the sector a long time ago, and to this day, if someone throws something at me that I have never heard of or don't understand, I ask. The best thing about IT is that things change so fast and there is a new language always being created. Being able to move with the issues in a very fluid way without being intimidated by the pace of change is part of what it is to be in IT. I don't think it's something to be concerned about. It's actually something that makes it exciting."

School of Computer Science and Software Engineering at Monash University, found through her research that 90% of women were turned off by an industry they believe is full of balding men with glasses. They felt the industry would not provide them with variety, and that they would simply sit in front of a computer all day.

Some girls are beginning to get the impression that the IT industry is young, hip and cool, but that doesn't appeal either, said Anne McMahon, women's strategy officer at Sydney Institute of Technology. "Not many girls would put themselves in that category," she said. "They get the feeling they will not be able to juggle family in such an environment."

"I speak to girls about my career and it is almost as if they don't believe me," said Moffat. "Their first questions are: 'Are you married?' and 'Do you have children?'. They think IT is a choice of career over life."

IT's image problem is not just turning off potential female workers. The industry needs a makeover to attract men as well (see APC September 1998, page 65). Par-

ents often assist their children in their career choices and in many cases, they are not encouraging their kids into the IT sector. Most parents are concerned when a child of any gender sits in front of a computer screen for hours on end, but when encouraged in the right manner and balanced with other activities, it can lead to a very lucrative, interesting and successful career. Computer science graduates receive the fifth-highest starting salaries of any graduates, according to the latest Graduate Destination Survey by the Graduate Careers Council of Australia.

The Australian Information Industry Association estimates there are 30,000 vacant IT jobs in Australia alone, and domestic and overseas travel opportunities abound as IT skills can be used worldwide. Promotion is relatively fast, and the work is always changing and challenging. These are all features young women want in their careers, Price's report found. Factors such as the ability to participate in teamwork, travel, challenges and a good salary all influence young women's decisions about their career choices. If only they knew what

they were missing, they might make different choices, she said.

"The challenge becomes talking about what it is to work in IT these days," said Senator Kate Lundy, shadow minister assisting on IT. "It's about working with an extraordinary new medium that finds its place in a community of people. In my mind it is so broad, though perhaps in the minds of many it is still so narrow."

To appeal to young women, the IT industry also needs to convince them of its social benefits. But many argue that the best way to increase female participation is to tackle fears about having to study highly technical subjects, whether those fears are based on being bored to death or finding the subjects too hard.

Get 'em young

Educators, academics and industry representatives believe that if young women are to become more interested in and comfortable with hard-core technology, we need to encourage their enthusiasm for it at a young age.

Confidence is key, Lundy said. "Primary school is where children build self-confidence and self-esteem, and having confidence with technology at that point sets the scope of what children think is possible. Provided no barriers are put in place and the door to an IT career is opened up at that time, in the latter years young people can formulate ideas about what they want to do without restrictions."

Equal access to computers is crucial, and teachers need to watch that male students don't monopolise the PCs, she said. "If young people perceive, even at primary-school age, that there is some gender distinction with the use of technology, it will do untold damage."

It is not as simple as just dumping girls in front of the computer; you need to get them excited about being there. Research indicates that girls, unlike boys, don't like playing computer games, so forcing them to play games won't entice a love of technology, and neither will transferring 'girls' toys to the computer in all cases.

"It is a question of utilising and exploiting the diverse content that is available, not only on the Internet, but

also through the vast number of multimedia publications that are available, and finding out what captures the imagination of each child," Lundy said.

It is also a matter of using the teaching methods that suit the individual. "Boys tend to view computers as toys, objects that need to be understood. Girls, on the other hand, view technology as a tool. Women want to know the rules and the consequences, and don't want to risk making a mistake, but it is almost impossible to play a video game if you try and understand it first and play it second," states *Information Technology: Windows of Opportunity for Women*.

"Computer technology needs to tap into women's experiences and use tools that women are familiar with such as the telephone, and the extension of this technology to the Internet," the report states.

Much success has been gained in introducing technology to girls in a more subtle manner than forcing them to take specific technology subjects.

"We do it in a very low-profile way," said Janette Emmerson, from Abbotsleigh girls school in Sydney. Technology

is used as an educational tool across the curriculum from junior school onwards. Specialised computing studies are not offered until year 11, but all areas of study involve some computer-based work. Each student has a password-protected network folder which can be accessed from any of the PCs on campus. "All children should have basic skills and comfort levels; they are going to need them," Emmerson said.

"Some people believe that if you don't supply specific IT courses at a very early age, you don't feed girls into the hard-core courses and get them hooked. But this has not been the case with us," she said. "Using our method, girls can incorporate the use of technology in all their subjects." Computers with access to the school's intranet are located across the buildings, including in specific computer rooms, the library, the music school, senior study centre, and the visual arts area.

Kilvington Baptist Girls Grammar School in Melbourne has taken a similar approach, incorporating technology in all aspects of education, making it transparent and ubiquitous instead of something special, said principal Di Flemming.

Sandie Downey, Skills.net Roadshow coordinator

An IT evangelist-cum-swaggie, Sandie Downey spends her time travelling from town to town, teaching people how to use the Internet as part of a \$5 million Victorian government scheme.

The worn boots and telltale swag have been replaced by a couple of mobile phones (analog and digital), a Web site, and a well-equipped van packed full of notebook computers and modems.

In the last 18 months, the BHP Skills.net Roadshow has visited 547 towns, travelled 63,260km, and trained 14,423 people. Thankfully, Downey loves driving, having "grown up in the back seat of a car". This March alone, she is scheduled to move through Moonee Ponds, Horsham, Cheltenham, Wangaratta, Yackandanda, Adelaide, Apollo Bay and Queensland's Gold Coast — just to name a few. She will set up her laptops and modems wherever they are requested, including public libraries and courthouses, conferences, seniors expos, music festivals and agricultural field days.

Her training sessions are booked out until October. "I don't think even they realised what one short, fat lady in a van full of laptops could do," she said, laughing.

The service is provided to people without Internet experience. "It's a great feeling to be helping bridge the gap between the technology haves and have-nots," she said.

Downey is also breaking down other barriers and helping to change the image of the typical IT worker. Most of the people on her courses expect Downey to be young and male, but instead they are confronted with a motorbike-loving, gumboot-clad mum who can communicate with everyone, from dairy farmers to senior citizens.

Many of those who learn skills from Downey will pass them on to others in their community. Those who don't continue to access the Internet after their lessons — and they are in the minority — have at least made an informed decision about why they won't, she said. Downey believes the Internet breaks down age, gender and distance barriers. "Everyone is equal on the Net; it is up to you what you do and say. It is a very empowering tool."

Downey describes her introduction to the Internet as similar to becoming a born-again Christian: "When I found out about the technology, I saw the potential for it to impact positively on my life." Downey first

learned of the existence of modems and the Internet from a librarian when she was a distance education student in the late 1980s in Whyalla. When she continued her studies in Adelaide, it provided an opportu-



nity to learn even more about the media, where she soaked up discussions on the subject "like a sponge". For her, the Net has offered an avenue for finding parts for her hobby of restoring motorbikes, access to political activism, and a subject of conversation for her and her children.

Mandy Cramer, manager of Electronic Business, Department of Defence

Mandy Cramer worked her way through the ranks when computing was young. In 1973, she became a computer operator quite by accident, when she went to the Commonwealth Employment Office in Adelaide searching for a job as a data processor. There were none on offer and she was convinced to sit an exam to become a computer operator, despite a lack of training or qualifications, because they were in short supply. After a number of interviews she was offered a job, and the opportunity for her and her husband to be moved to Canberra for training.

The move to Canberra proved taxing, but 25 years later she is still there. Computer operators were different then, she said. "It was a very technical job. The course I had to do was nine months of classroom training and practical experience. We needed a lot of technical knowledge, unlike today — and [we had to know] like the speed of rewinding a $\frac{3}{4}$ in tape. It was much more technically demanding. We used to have huge printouts and we'd be on our hands and knees reading the system dump trying to find the problem."

Cramer moved to the Department of Defence quite early on in her career. "My memory is that I was the first female com-

puter operator with Defence." She worked one of three shifts: days, evenings and 'dogos' (basically midnight to dawn). "I heard that one of the major consternations among the workers was that they wouldn't be able to swear, now that a woman was working there — as one does when it is 3.30am," she said, laughing.

"I can't remember any problems or hurdles. One thing I do remember from when I was a naive and silly CO2, was an interview for a higher position. I knew nothing about equal opportunity. I recall that in the all-male interview the turning point was when they asked me how did I think I would cope (and just to let you know, I am 4ft high) with a drunk 6ft male computer operator at 3am during a shift. Needless to say I didn't get the job."

Cramer did become the senior operator in one of the computer rooms at a later stage, and was often the last person visitors would expect to be in charge in such an environment. One man who was directed to her went up to the janitor (who had mop, bucket and dust jacket in tow) expecting him to be the boss.

"I can't say I have had big problems. You obviously had to try to prove yourself a lot more. I have managed to hold my

own. I'm a product of latching onto a topic, making sure you grasp it, and not flitting on to new jobs all the time."

Cramer admits she probably could have worked up to a more senior rank, but made a conscious decision to remain



where she is for lifestyle reasons. "There is very little money difference to go from a SITO B to a SITO A, unless you jump up to SES level. But they want so much more of you."

"Technology as a concept has become a bit of a yawn for the students — they just use it," she said.

Five years ago, Flemming read a statistic that forced her to act: 85% of children in year 5 in 1993 will go into jobs not yet created, using technologies not yet designed. She was inspired to ensure that the girls at her school would leave technology-literate.

Each student has her own email address linked to the school intranet, which is used as a learning tool and as a means of displaying and submitting projects. Software applications are used from an early age, and a lot of teamwork is involved.

Higher and higher

Most education institutions offering IT courses have links to careers counsellors and schools to encourage enrolments. Some have gone further, such as the Australian National University (ANU) and the University of Wollongong, which offer practical advice and communication links between potential IT students and those in the industry.

About 20% of ANU IT students are women, a figure similar typical of technology programs across Australia. "There is definitely room for improvement," said Denise Bett, education officer for the Faculty of Engineering and IT. Last year, the university held a two-day Women in IT program designed to increase female participation in courses. About 60 girls with an interest in IT from ACT colleges and NSW and Victorian high schools were given 'hands-on' opportunities to experience the latest IT developments, broaden their scope, and explore available careers. Even though these were young women who had already shown an interest in technology, you can't assume they have all had access to the latest technical resources through home or school, Bett said. As well as encouraging enthusiasm and enrolments, the program creates relationships for future students so that they don't feel isolated at university, she said.

Bett added that it is important to continue school visits that start with younger girls. "Then the students can focus subject selections so they can be channelled correctly." Research shows that young women tend to concentrate on humanities

at high school, thus limiting the university courses which are open to them. They often underestimate their abilities in maths and science, therefore avoiding subjects that could ultimately lead to technology careers, Bett said.

The University of Wollongong also conducts school visits and encourages girls to find out more about IT in special settings. Last year it organised two morning-tea sessions so girls could come and speak to female staff and students about courses and careers. A few years ago, half of the students in the university's Bachelor of IT course were female, but last year, representation dropped to 20%, Cooper said. Next year she is hoping for a much larger female representation; 90% of the HSC students who attended the morning sessions have applied to study IT at the university, she said.

Even when women enrol in higher education IT courses, it is hard to keep them there. Women make up between 20% and 30% of first-year students at computing courses at Monash University, but only about 10% complete the degrees, Carbone said. She believes part of the problem is the teaching methods and attitudes. Most of the IT trainers are the brightest, most technically

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Tania Edwards, senior database administrator

As a contract IT worker, 26-year-old Tania Edwards has the luxury of freedom. Since completing her BSc in computer science, she has worked as both an applications developer and database administrator, been on two extended overseas holidays, and worked for four separate organisations. Edwards is also considering working in the US for a short term when her latest contract is completed.

"Although you work hard, you get paid good money, and when the contract is up, you know you can afford to take a few months off to travel," she said. Perhaps she should add 'and rest'. Her work involves long hours as she is on 24-hour call.

Edwards spends her time looking after Vodafone's databases, keeping them up

and running and performing well, as well as providing user support. "The job requires you to be very responsible and quite committed. You become crucial to the business; the database systems you are managing are high availability, so you are high availability."

"There is a design and creation aspect and I get to interface with users; it's not so dry and technical as some IT areas. I like communicating with people and problem-solving," she said.

Edwards' interest in IT started when she first studied computing in year 8. "I thought it would be a good career, because unlike medicine and vet science you can finish study and move into the workforce quite quickly. Three years and you are out there, and if you want to

change career path there are often intensive training courses that can be taken between jobs or during leave time. In five years, you can achieve more than in many fields. I want to have kids and get married too."

Edwards was one of only a handful of women in her BSc course. "It never mattered to me; I am used to being around more men than women. It was of course very obvious when you walked into a room."

Edwards said the lack of women in her field didn't cause too many problems for her, but added: "You do have to learn to stand your ground among the men and sometimes you may need to work harder in the beginning, to show them you know what you are doing."

mindful and gadget-loving of men, and they see the first-year courses as simple enough for anyone to do standing on their head, she said. "They want students to learn on their own, like they did." Carbone believes this causes frustration among female students who end up 'hating' computers.

Ultimately the solution, she believes, is not only to change teaching tactics, but also to ensure that every degree has an IT component with information on such things as Internet research, email and word processing, as well as specific software packages that pertain to their chosen industry.

The IT industry is regarded as one that is very accepting of re-employing and retraining women who have taken time off for family reasons, and for offering work-at-home opportunities for those who need to spend time away from the office. But what if you had never considered working in the industry?

There have always been courses offered by both private and public institutions, but costs and a lack of confidence in their technical ability have often meant women have avoided them, said Heather Riach, information technology lecturer at the Regency Institute of TAFE in South Australia.

Regency Institute has been trying to overcome the 'I'm just a housewife' syndrome by offering inexpensive courses for mature-age women to build their communication and study skills and encourage them to undertake further study towards a professional career. The TAFE has recently added computer studies to its \$20-a-term classes. The classes start at a very basic level, explaining jargon and word processing, before moving on to other application

software. The course also includes a history of women in computing and a discussion of career opportunities. The courses can lead to a diploma in information technology through TAFE. Women who have never touched a computer before have ended up completing the diploma and entering the workforce, Riach said.

Once in the workforce, there are a number of organisations that have been set up to support female workers. Women in Information Technology (<http://www.wit.org.au/>) and Females in Technology (FIT; <http://www.fit.org.au/>) both have branches in a number of capital cities, and the Australian Computer Society has a Women in Technology committee that holds regular lunches and runs a mailing list. The idea is for women to meet, network, support and encourage one another in advancing their careers. "Some people think all we do is sit there and bitch about men, but that is not the case. It's more about sharing strategies for attracting women to the industry and keeping them there," Carbone said.

Role up

Many women APC spoke to see role models as a crucial part of encouraging more girls into the sector. Without a high visibility of women in academic and corporate positions, it is hard for others to imagine IT as a possibility. Also, girls are more likely to enter non-traditional areas if a parent or someone they know is already in that industry, McMahon said.

Cooper said that students needed more female teachers as role models and for

support. "While there are quite a number of women educators in the IT sector, not many have made it to high positions. There is very little peer support," she said. "Women feel isolated, and it's very hard to explain to men that they don't feel comfortable, as men have long-established ties and networks to take advantage of."

Role models are the voice of experience, said Lundy. "It's about being there and doing it, and being able to talk about it and sharing your experience. You might turn people off or you might serve to inspire an interest, and I think whatever happens it demystifies IT and that is the most important thing — that it is not scary, it's not intimidating."

Moffat spends time on school visits, but suggests she is getting too old to impress school-age girls. "They look at me and think, you did it, but you are abnormal." They need to talk to women who aren't at the top yet, but who are making it and making money — people more like them and closer to their age, she said.

But do we need more women in the industry?

In short, yes. If for no other reason than to help solve one of the biggest dilemmas in the IT industry — the skills shortage. "Bringing 10% more women into the industry would solve the skills shortage, simple as that," Moffatt said. "If we are going to be a clever country, organisations, trainers and employers need to utilise our human resources better. We need to be careful about where and how we train people; they need to be skilled in



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areas where there are jobs. IT is obviously one of those areas," McMahon said.

However, there are many other reasons why it is important for women to become more involved in the IT industry, for their own benefit, as well as to assist the development of the industry. At the most basic level, many believe it is a simple issue of equity and ability. There are dangers in excluding women — by accident, nature or otherwise — from using the technologies that have become a significant part of Western life.

"IT is central to the way we will live our lives in the future," said Lundy. "It is central to the way we will interact as a community, and to the business systems of the future. Because it is such an empowering medium, it is absolutely essential that we are actively mindful of the gender equity issues involved in the adoption of technology. It will always be an inequitable society unless we have equitable gender representation across all fields."

Women will be marginalised if they don't participate, academics have warned. "If girls are not educated in these technologies, they will not be vocationally prepared. It is educational negligence not to ensure girls are prepared for the future," Flemming said.

"Girls say they don't like computers, but whatever profession they say they are interested in, I manage to involve computers in their work," said Carbone. "Even if they want to be a hairdresser, they will need a database and perhaps even use software programs to change people's hairstyles."

Girls are also missing out on the benefits of what women already in the industry regard as unbeatable perks — stability and economic comfort.

As the use of computers and other technologies by women increases, so too does the need for their involvement in ensuring devices and applications fulfil their needs, said Julie Johnson, from the school of Computer Information Science at Edith Cowan University. This also has positive advantages for the industry, she said. "The best products are those ones where the people who develop them know the needs of those who use them."

Carbone added that it is important to have a good balance and input from different people. Ensuring the builders of computers are diverse helps ensure that all people's computing styles and needs can be met.

Many of the conversations APC had with women on this issue started with "I hate to generalise, but . . .". In many instances, women do work and think differently from men, they said. As the industry continues to evolve, becoming a central business driver,



Ann Moffatt, organiser of Females in Information Technology and director of Technology Solutions

it needs the cooperative, team-based communication skills that women supply.

"Men tend to develop things from a technical perspective and they are not very intuitive, whereas women can provide the intuitiveness. The two combined can work very well," Carbone said.

Some, such as Moffatt, went so far as to suggest that an increase in the number of female IT workers would calm down an industry that is more concerned with building things bigger, faster and better, rather than meeting business requirements.

Me hunter, you gatherer

Discussions about increasing female participation in any industry run the risk of becoming a heated debate about men versus women and all of the associated stereotypes: hunter versus gatherer, field plougher versus nurturer, doer versus helper. Technofetishism is gender related, said Matthew Allen, coordinator of Internet Studies at Curtin University of Technology. "It's a lust for the machine and for the maintenance of control, and it's a male thing."

So why force women to do something they don't want to? As Joan Cooper explains, it is not so much a case of forcing girls to study IT and subsequently embark on IT careers, but ensuring that the career decisions they make are based on the correct information and assumptions. If they know what it's about and they still don't like it, fine, she said. It is still crucial, however, for all women (and men) to gain basic computer skills, she said.

Whether the proportion of women in IT

reflects the proportion of women in the general population will depend on just how well the sector is sold to potential workers, and on individual decisions about which career is right for whom. Equal opportunity doesn't necessarily translate to equal participation, APC was told. Even with opportunities, women may still gravitate or be relegated to particular IT work. Whether this will be the result of likes and dislikes or perceptions about gender is open to debate.

Regardless of gender, IT is a broad industry and needs techie all-night coders and system builders, as well as team-based writers, communicators and organisers, Lance said. IT is not for the hunter alone. "I believe my most important point is that the requirements for good people in IT tend towards classically 'feminine' qualities, rather than the stereotype hacker, but both approaches have their place and the very best staff cover the whole spectrum," she said.

There are indications that once school-age girls and women wishing to change careers are aware of the work available in the industry, they are more likely to be attracted to IT. As the ANU's Bett said, "The best way to encourage IT use is to supply the right technology experiences."

Perhaps part of the problem with the lack of women in management is that many women don't want to make it to the top. Many in middle management come across a different type of glass ceiling, one that is self-enforced and motivated. Many women make a lifestyle decision. They don't want to work 16 hours a day, six or seven days a week, or to travel three out of every four months, so they don't take on the highest-level positions where that is expected.

Most of the young women APC spoke to said they had not encountered any problems working in a male-dominated industry; however, almost in the same breath they said that they had to work harder to prove their worth. This apparent inconsistency suggests the need to work harder is not seen as a problem, but instead is accepted as the reality of women's experience in the workplace.

Veteran female IT workers who have made it to top-ranking roles noted many battles, and said that perhaps the younger women would only come across problems as they tried to seek promotion. The young women suggest times may be changing and they are becoming a more accepted part of the industry. The reality may only become clear as the new recruits gain experience and attempt to increase their responsibilities and pay packets. Watch this space. ■



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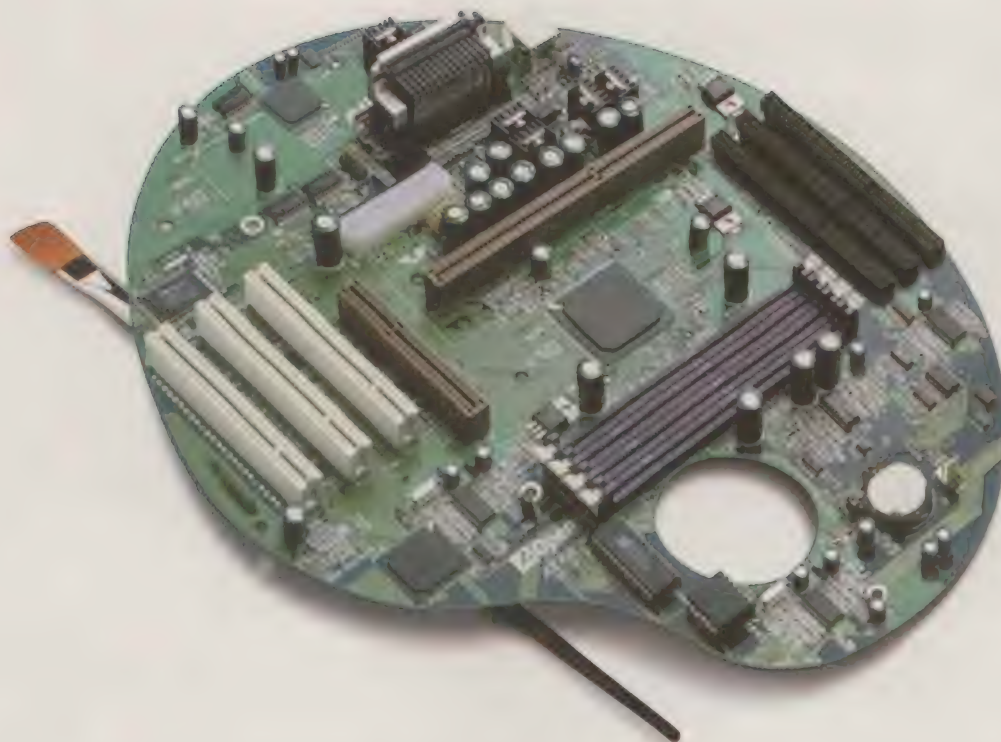
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Angel at the dealing table

As the venture capital market matures, and bright kids with great ideas sell them off and cash up, there's a new investor niche opening up — one-off 'business angels'.

By David Forman

Money begets money, so they say. Certainly, that seems to be hope of those countries trying to emulate the wealth-creation model of California's Silicon Valley. Ireland, Israel, Australia, Malaysia and Singapore all see participation in the explosive growth of the information industries as key to national prosperity in the next century, and the channelling of investment into these industries is seen as the crucial first step.

One of the accepted methods is an attempt to re-create the investment institutions that have underpinned the US growth cycle by powering the boom in startups. And the key institutions are generally regarded to be specialist venture capital investment firms — investment fund managers willing to take the plunge into risky investments, such as IT&T startups, that banks and other traditional investment funds, such as superannuation fund managers, cannot take.

Creating venture capital firms is seen as a means of building the intermediaries necessary to give traditional investment institutions the comfort to finance the industries of the future. Venture capitalists (VCs) specialise in making judgements about which companies are likely to make it in the fraught information industries markets. So, superannuation funds, for example, can have an exposure to the potential for high

returns through the VCs' investment funds, without having to become instant experts in technological markets moving at the speed of light.

Venture capitalists are also important because they quickly cross-fertilise the management lessons learned from one successful start-up company to the next, and build a community of expertise. The best of them — such as Kleiner Perkins Caufield and Byers, the kings of Sandhill Road (the venture capital heartland of Silicon Valley) — have experienced entrepreneurs and investment analysts as partners. The partners not only involve themselves in the development of business plans within their investee companies, they also develop synergies and partnerships between the startups.

Among the most successful of the national development schemes to try to imitate the Silicon Valley experience has been that of Israel. It is a country which has had about 2,000 successful information industry startups and has more companies listed on the Nasdaq exchange than any other country outside the US. The Economic Outlook statement released by the Israeli Ministry of Finance last August said high-tech exports grew by 20% in the previous year, and most of its 1.9% GDP growth in 1997 originated from exports of high-tech industries. "If one uses the engine of growth analogy, which has become rather *de rigueur* in economic surveys, one may regard high-tech industrial exports as a rather small engine (about 15% of GDP) that pulls a rather long and heavy train," the ministry noted.

Israel kick-started its high-tech startups by artificially inseminating its venture capital market. The Israeli Government provided taxpayers' money through the Yozma scheme to supplement private money raised by the VC funds. So successful was the scheme that Yozma was privatised into the now thriving Israeli VC market a couple of years ago.

Australia has in turn imitated the Yozma scheme with the Investment Innovation Fund (IIF), providing \$2 of public money for every \$1 of private money raised by five VC fund managers licensed to participate in the scheme. It all sounds so elegant and simple that it seems a sure-fire



winner. But just as Australia's IIF funds are making their first round of investments, some funny things are happening in the country where it all began. Venture capital firms have been so successful in making money that they appear to be doing less and less of what governments would like to think they are doing — providing seed and first-round funding for very young companies.

Research by the Center for Venture Research (CVR), based at the University of New Hampshire, suggests that it is instead private equity investors, popularly known as business angels, who are emerging as the crucial ingredient in early stage funding for startups in the risky information industries.

The CVR has researched the business angel market since the 1970s. Its director, Dr Jeffrey Sohl, says private investors have always been a crucial but underrated ingredient in the US success story, because

Angels have always been quietly in the background, driving the growth of IT&T startups, Sohl said. CVR research estimates that nationwide they invest \$US10 billion to \$US20 billion annually, he said, compared to the \$US12 billion invested by VCs in the US last year, a record high.

But angels have recently assumed an even greater importance, according to Sohl. As more money has been made by investors in startups, particularly in the Internet boom of the past three years, more money has poured into the venture capitalists' funds, and the nature of their business has been changing.

The average size of a VC investment rose to \$US6.5 million in 1997, from \$US3.5 million in 1992, an 86% increase, according to San Francisco-based investment research specialists VentureOne. The average total amount raised by companies has increased from \$US9.5 million to \$US21.5 million.

In the past 18 months to two years, much larger alliances of 100 or even 200 angels have emerged.

their activity is by definition private and difficult to measure. But CVR's years of research have allowed it to compile a profile of the archetypal business angel and make some estimates of the total size of their economic activity.

"The profiles, although they are changing, are still predominantly white males, some with postgraduate degrees, in the 55-year-old range," Sohl said. He suspects that the average age might have fallen somewhat since the CVR's last research, two years ago, because of the number of cashed-out, young entrepreneurs that have joined the angel population in recent years. The minimum net worth to qualify as a potential angel, excluding the family home, is \$US1 million.

"I never use Bill Gates as an example, because then people think that's the average or the type, and he's really so far out," Sohl said. "The average angel has a much smaller net worth than that — although it's still a very large net worth — and that's their job, investing in these companies."

The average investment by an individual angel is \$US300,000 to \$US500,000, but often they will invest in syndicates of four or five. Sohl said they tend to invest, individually or together, in deals to raise funds of between \$US100,000 and \$US2 million. "Clearly early seed, start-up stages."

Geoff Baum, vice-president of marketing with the recently launched online investor matchmaking agent, Garage.com, said the venture capitalists' investment funds have ballooned accordingly, but the number of partners working for them assessing deals has not been able to keep pace. "These funds have gone from \$50 million to \$75 million to \$100 million, now they are starting to be \$200 million, \$250 million, \$300 million. But the partnerships have gone from three to four, maybe five people, and sometimes the bigger ones have 10 people," he said. "They just can't ramp up their staffing and there's not a school where you learn how to be a VC."

The problem this creates is that larger investments are typically not in the seed or start-up stages of a company's development, but in the later expansion stages. Therefore, VCs are tending to invest more in companies that are more mature, raising the prospect of a new 'capital gap' in the early investment market.

"These funds have gotten so large that they can no longer do a seed deal of \$US100,000, even a \$US1 million seed deal, because they would have to do too many of them," Sohl said.

Sohl says a new phenomenon has emerged in the angel market that may be filling this space. Angels have long


invested together in small groups of four or five. Typically, one of the group will bring the prospective investment to the others, and will take responsibility for supervising the company's development and management, while the others will be passive investors. The members of the group might each be invested in several companies, but actively overseeing only one each.

But he says in the past 18 months to two years, much larger alliances of 100 or even 200 angels have emerged. When one member of the group finds a good deal, he brings the entrepreneur to the group to present his or her business plan, and others might join in. "There may be only six to eight that syndicate for a deal, but they get exposure in a kind of venture forum format," Sohl said. "But the difference is they already have some angel money, namely the angel who's the member of this large alliance. And the other angels are invited in to round out the deal."

This investment introduction technique is moving the angel into the gap in the investment market left by VC firms moving up the food chain. It is also changing the relationship between angels and VCs. CVR research has long shown what it calls a 'sequential complementarity' between angels and VCs, meaning angels have been the feed farm providing seed funding to companies that the VCs can invest in later. Indeed, a 1995 study by CVR found that angel investors were the most common source of seed and start-up capital for technology-based companies in the US, notwithstanding the amount of attention given to VC firms. But the latest research shows a developing 'contemporaneous complementarity' — that the angels and VCs are increasingly investing together.

There is also a new type of business emerging that is in effect a hybrid of the two investor types. Garage.com, for example, provides an Internet-based matching service, linking investors with entrepreneurs, performing its own screening to make sure prospective deals are up to scratch. Baum pointed to the growing number of "potential blockbuster startups" which are not getting funding from VCs because they are simply too small, but which are also not plugged into the informal networks that bring deals to the attention of angel financiers. "So there's that gap, and that's the gap we're playing into," he said.

Sohl said angels continually complain of a lack of quality deal flow. Some will employ 'gatekeepers' to filter deals for them, and others will rely on service providers such as lawyers, accountants



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and business consultants, or other angels, to bring deals to their attention. Garage.com's business plan is to formalise and extend those networks, while taking both a fee for service and equity for revenue.

But Sohl says the angel market is highly regionally based, and quite narrow in the industries it focuses on. Because most angel investors have been successful entrepreneurs themselves, they tend to focus on industries they understand. Also, they are only interested in high-growth investments. In practice, this means most of their activity is concentrated in IT&T, because that is the business background of most angels. Sohl said there is little interest in biotechnology, because the regulatory approvals process is so onerous that it increases time and risk. Also, angels will not travel far to do a deal. "As they say, good deals don't have feet!"

This means angels are less likely to travel than even the notoriously home-bound venture capitalists. He says active angel markets exist in places where there is a good lifestyle for cashed-out entrepreneurs, and a university producing innovation, an educated labour pool and new entrepreneurs. He nominated Silicon Valley, Route 128 outside Boston, Seattle, Austin and North Carolina as centres of activity.

On the upside, Sohl said angels typically have more straightforward investment terms and conditions than VCs and, although they are very active advisors to the entrepreneurs they back, rarely want a controlling equity stake. He said they usually take a 10% to 40% equity stake with "40% being a little high". "They want the entrepreneur to work hard, and they are going to be keeping their feet to the fire, but they don't want 51%. You rarely see that."

What does this mean for policy-makers trying to join the information industries party? Sohl said policy-makers do tend to have heart attacks when he suggests that the money they are spending on stimulating venture capital might not be the most efficient means of achieving what they want. However, he said they have by and large acted in the best possible way — by doing nothing. Angel markets are growing and getting more publicity without attempts by policy-makers to artificially create them. This suggests that the principle 'money goes where money is' still holds. It's just that the source of the first dollar might be changing.

These days, if your small but established technology company can't offer potential return in the 'multiples', you may as well forget about the prospect of a business angel coming to the rescue — venture capital investors are seeking a quick pro quo. **By Helen Dancer**

Multiplication (that's the name of the game)

Got a hot tip on a small Internet company? You could make a fortune in six months. The average return on Internet or high-tech-related initial public offerings (IPOs) is cruising at around the 120% mark, although initial returns in the first couple of days have been as high as 400%. On the other hand, you could invest in a secure, maturing technology vendor, get a steady 10% or 15% return, and see your money grow, not like Jack's beanstalk, but something that would seem like a pretty good investment in a normal, run-of-the-mill stock market.

So, which option are you going to choose? It's not too difficult to understand why, on the face of it, start-up Internet companies are winning hands down over more established ventures in the capital investment stakes. But the experience of small maturing technology companies in Australia is that such fast turnaround, overinflated investments can be counter-productive in sustaining a healthy technology development environment.

Ian Davies, managing director of Odyssey Development and creator of the ISYS and ISYS Web family of text retrieval products, said one of the major disappointing by-products of the current pressure-cooker, stockmarket-driven capital invest-

ment market is that small, stable, profitable technology companies are not getting a look-in in the investment stakes. "Typically, our experience has been that potential investors look at us and say, you're not in trouble, there's no opportunity for turning you around [ipso facto] there's not enough for us in investing in you."

The fact that his company is profitable, stable, has good balance sheets and a predictable product rollout is, ironically enough, a turn-off for investors, Davies explained. But for once it's not just an Australian thing. "No, not at all, in fact. We've had the same response from American VCs we've talked to as well," said Davies. "It's more realistically a commentary on the overheated state of IT companies and their valuations."

This frustrating predicament has been wrought, in large measure, by the fantastic market capitalisations and meteoric share rises of small 'rocket stocks', of which the most talked-about example of late is surely Internet bookseller Amazon.com.

Amazon.com recently announced a three-for-one stock split. It has a market capitalisation of \$US25.4 billion. This makes it worth more than department store chain Sears and Roebuck, which boast a broad US physical retail presence, a diverse range of



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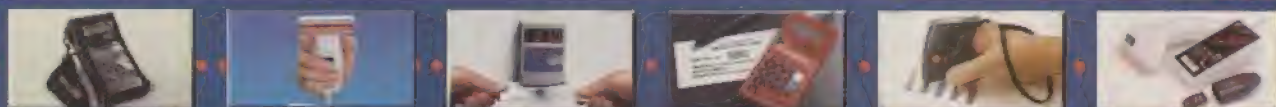
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goods and a well-established profile and traditional selling methodology. In early January, Amazon.com's share price rose to \$US199.12 before settling at \$US160.25, an almost unprecedented proposition given that the stock was only worth \$US8.25 one year ago. Add to the equation the estimation that, despite the mammoth volumes shipped, Amazon.com has yet to prove its business model, and that every book is shipped at a loss, and you come up with a concoction that suggests more of sinking sand than bedrock.

The other notably stellar performer in the Internet sphere is Yahoo. Its share price rose in January to \$US357.37 compared to \$US28.81 a year ago, and it is estimated to be worth \$US33.9 billion, but its business model still has traditionalists shaking their heads and predicting a bubbleburst any day now.

Stock market players' and analysts' view of the situation is typified by comments made by James J Cramer, manager of a hedge fund and co-founder of the popular stocks and shares Web site TheStreet.com. "Very few people believe that these stocks will be up appreciably a year from now. Very many people feel the stocks could be up big two weeks from now. So, the goal is to be in, take advantage, and then get out."

Despite the acknowledgement that it's puffery rather than substance, the market continued to talk up Amazon.com's prospects. Henry Blodget, an analyst with CIBC Oppenheimer, said the stock had the potential to go as high as \$US400.

Blodget acknowledged that the company had yet to prove itself and that its shares represented a "scary buy", but pointed to the rapid increase in the number of people buying goods over the Internet, combined with Amazon.com's prospects for diversifying into the music business, as proof that its success curve is still climbing. He told TheStreet.com's Suzanne Galante that Amazon.com's share price was "clearly more art than science", but maintained that it would be driven still higher simply by the sheer force of its own momentum. Its revenues are growing at 300% a year, he said, but he acknowledged that the company is still not expected to turn a profit until 2001 at the earliest.

In such a climate, the prospects for getting other good ideas off the ground seem somewhat less attractive. The small technology companies APC spoke to agreed that the average venture capitalist is not interested in even talking unless the investment sum is substantial — \$5 to \$10 million, or upwards. "They make the



Ian Davies, managing director,
Odyssey Development

point, and it's a very valid one, that they have to do the same amount of research and do the same due diligence whether they are talking about half a million or five million, so why go to all the effort on such a small investment opportunity?" Davies said of his recent experiences.

On top of that, there's the overinflated expectation of the return — not in percentage terms, but in multiples — five or 10 times the original investment. "If a VC can't look at you and estimate the potential return on investing in you in terms of multiples, they're just not interested."

Which leaves strong but growing companies like Odyssey with very few places to turn in the investment stakes, because neither is the interim option, of the business angel with typically half a million dollars to invest, such an attractive proposition. "Let's face it, for a company this size, the prospect of a business angel coming in and offering us \$300,000 is not terribly exciting."

"The point at which \$300,000 to \$500,000 would make a difference is for the guy sitting in a room with a great idea," Davies said. That's the point at which a small cash injection makes the most sense for both parties, when the new idea hasn't made any progress and can't get off the ground without outside intervention.

"For that kind of investment [\$300,000] the angel could probably pick up half the enterprise." It's a significant enough investment to give the inventor enough momentum to get the idea off the ground, Davies explained, an opportunity which might be well worth giving up half the business, despite the usual well-founded reluctance of new businesses to surrender equity.

Still, in such an overheated, overinflated market, calm voices like Davies' are exhorting us to keep our feet on the ground and revisit the fundamentals of business. There are two reasons why you'd invest in a company, he said. First, to reap a share of the profits through the dividend the shares pay you, and second, to enjoy the capital appreciation of the share price. "Even if you're investing in a company like BHP, the capital appreciation is what you're focused on. The dividend is something that trickles along, it's not the reason you're doing it."

"You need to look at things like, why is the share price going to go up?" he said. "I always go back to the example of the tulips. People were paying 20,000 florins for a single tulip bulb, on the basis that they were so rare. But when you propagate tulips they are no longer rare, so the intrinsic value immediately falls out of the market."

Similarly, he points to the speculation on shares in exploration company Poseiden in the early 1960s. The shares went from 7 cents, sky-high to the \$300 mark and back to 7 cents, without a single hole being dug, purely on speculation. Nothing gained. Sound familiar?

Going back to the fundamentals means examining — as in the case of the tulips — the basis of the value on which you bought whatever you're investing in.

There's a need, Davies asserted, to look carefully at the price to earnings (P/E) ratio when investing. If a share is worth a dollar and the dividend on that share is 5 cents a year, then in 20 years you've made your investment back. In that context the overinflated situation of the current investment climate is starkly obvious.

So is it all going to come crashing down when the Internet bubble bursts? "That's not for me to say, nor is the extent of the damage when it does," said Davies. "But if the Internet bubble were to burst, it wouldn't bother us one bit, which is a nice position to be in."

"We will ride out the cycle, or else learn to pitch ourselves differently. When we go looking for investment, or have people coming to us saying, why should we invest in you? We have to in a sense distance ourselves from the fact that we make software. In other words, present ourselves from a corporate point of view. Our pitch has to be, look at our performance, look at our history, our balance sheet, do you like what you see, like the flow of dividend you'd be getting from your investment?"

"Oh, and by the way, we make software." ■

bank payment services, but he predicted the Internet would open up more options and encourage international competition.

"Banks are not showing any leadership in this country," Prakash said. A "brand-based arrogance" made financial houses believe merchant services could be rolled out at their own pace. Banks need to start assisting businesses that are pursuing the online market, he argued. "It's unclear to me how banks plan to engage and service merchants and consumers," he added. "A mere rollout of service and the power of the brand are not sufficient."

Two for the show

In the absence of SET, the most practical option for Internet merchants is SSL. This protocol establishes a secure channel between a browser and an Internet server so that credit card details can be sent in relative safety. A URL protected by SSL is designated with the 'https://' prefix, and the major browsers designate secure pages with onscreen icons (see screenshots). SSL was invented by Netscape, but it quickly became a de facto standard supported by most popular Web server vendors including Microsoft, Lotus, Novell and the open source Apache Group. Eventually, Netscape submitted the protocol to the Internet Engineering Task Force which tweaked SSL 3.0 into a standard known as Transport Layer Security (TLS) 1.0, although the traditional parlance remains common.

While SSL secures the transport layer to ensure safe delivery, it does nothing to safeguard credit card data once it reaches the merchant. Gartner Group analyst Chris Le Tocq compares SSL to using a tele-

phone between clients and servers, Le Tocq pointed out that most SSL platforms only validated the server. SET services validated both parties to ensure non-repudiation. The lack of customer authentication leaves any SSL transaction open to denial by cardholders, creating a troubling risk for Internet merchants who may have already delivered goods or services.

Another questionable aspect of SSL is its weak encryption levels. Both SET and SSL are based on similar cryptography algorithms and standards. However, most popular US-made Web software is still limited to 40-bit

strength encryption available to some Internet sites through a technique called server gated cryptography. Essentially, a server module enables the client to step up to a full 128-bit SSL key, providing unbreakable security for applications such as the Westpac browser-based banking service that was launched last year. But server gated products remain available only to blue-chip end users such as banks and insurance companies.

Internet Explorer shows the "https://" prefix and a padlock icon with textual confirmation.



Other options such as the locally developed Fortify plug-in allow you to fully secure your browser (see page 102), while the Apache/SSL server is available at full-strength worldwide, because it was built in Europe using the Aus-

tralian-made SSLeay cryptographic libraries (see page 101).

SSL-based solutions may fall short of SET perfection, but the Web technology is fast becoming a pragmatic standard, because stony silence from the banks forced merchants to cobble together their own solutions. Most prominent Australian ecommerce sites, including landmark Sydney retailer Gowings, Sydney bookseller Gleebooks, and Barossa Valley winery Chateau Yaldara, all handle sales via SSL servers as an extension of existing mail-order and telephone business.

After investing considerable time and money in a workable solution, merchants will be reluctant to change payment systems down the track just to keep the banks happy. This catch-22 may further frustrate banks' merchant-engagement strategies, according to Prakash. "Because SET is not here today and companies want to do online commerce, they are going to get locked into a non-SET solution," he said. Many businesses are starting to look to overseas payment-clearing services because local banks don't seem to care. "If the early adopters go elsewhere and those early adopters become killer applications, the banks have lost them as customers."

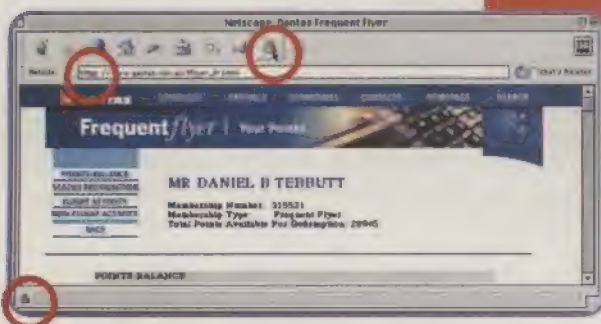
Three to get ready

Several alternatives are available for ecommerce ventures that want to set up an online ordering system immediately. The

key lengths, thanks to US export restrictions on encryption.

Dean Povey, a research scientist at the Distributed Systems Technology Centre (DSTC) security unit in Brisbane, said most capable organisations could crack 40-bit security within a week. Changes enacted last year by the Clinton administration allowed some freedom to export security products to trusted companies like banks, insurance companies and select Internet

Web pages secured with SSL are indicated by three display elements in Netscape: a padlock icon in the Status bar, the 'https://' prefix in the Location bar and the locked security info button in the Navigation bar.



phone scrambler when you are making a card payment via the phone. The principal objection is that SSL allows merchants to store credit details, raising the spectre of abuse by fraudulent merchants or theft by Internet hackers who raid ecommerce servers to grab valid card data.

Furthermore, while both SET 1.0 and SSL 3.0 provide for two-way authentication

merchants, but in the near future, the strongest commercial encryption that's likely to be available internationally is 56-bit. That's an improvement, but several international research projects have demonstrated that this level of encryption can be compromised relatively cheaply, using spare processing capacity on a network. Povey recommended 128-bit encryption as the best protection.

Recent US law changes made full-

Secure payment mechanisms are fundamental to ecommerce.

What's taking so long? **By Dan Tebbutt**

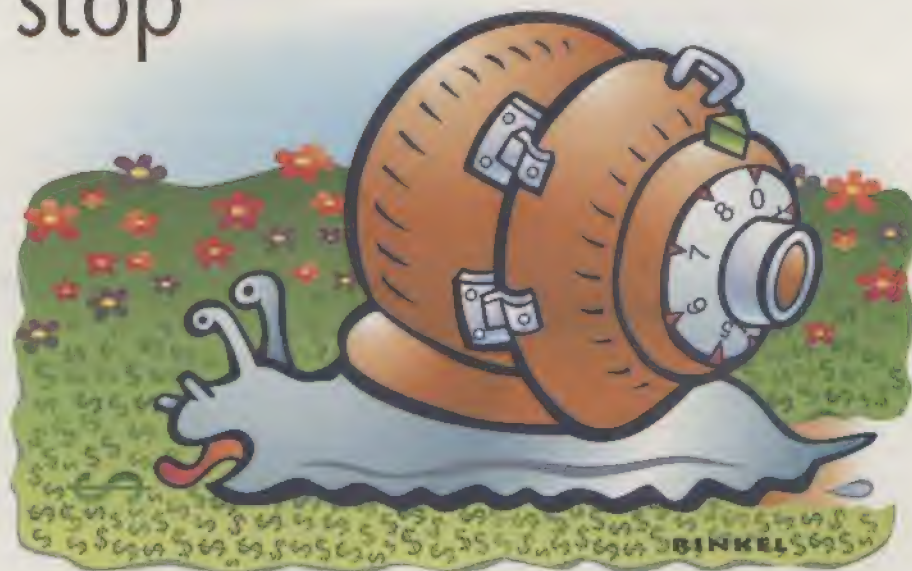
Ready, SET, stop

Electronic commerce is tough at the best of times. Competition is ferocious both at home and abroad. Slow, fiddly Web interfaces test the patience of even the most committed Net shopper. Communicating your products to a diffuse and indifferent customer base is a hard slog, so the last thing you'd want on top of these concerns is a disapproving attitude from your bank about online credit card payments.

Sadly, this seems to be the reality of ecommerce in Australia today. After betting heavily on the Secure Electronic Transactions (SET) architecture proposed by the dominant credit card companies, Visa International and MasterCard International, local banks were caught empty-handed when SET failed to materialise fast enough to satisfy current ecommerce needs. Would-be Internet merchants were often left high and dry, unable to clear online payments unless they chose from a limited range of expensive proprietary gateways.

Some banks sought to dampen consumer enthusiasm for Net credit card use even after the 16-digit numbers were established as the de facto currency of cyberspace. The high-water mark of bank resistance to the Internet came last December, when the Commonwealth Bank sent a stern warning to all Visa and MasterCard account holders. "Internet users: we recommend you do not disclose your credit card details over the Internet," the statement read. "Unauthorised goods and services may be charged to your account."

Electronic entrepreneurs like travel.com.au were reduced to taking credit card details over the phone, even though customers could complete every other aspect of their order online. Sydney-based Net shopping prodigy Greengrocer.com.au contemplated offshore payment clearance after what managing director Douglas Carlson described as a "pretty rough experience" with domestic banks. Ultimately, foreign services were rejected because customers would be billed



in US dollars, but Carlson said this option would return once multi-currency networks evolve. "It's a global market," he said. "If banks can't compete, payment processing will go offshore."

One for the money

How did this situation develop? We need to go back to February 1996, when, before Amazon.com had become a textbook business case, Visa and MasterCard agreed to develop a joint standard for Internet payments. Backed by IBM technical expertise, a specification was released in just a few months and the first SET payment was demonstrated in December 1996. The SET 1.0 standard was launched officially the following June, but since then, its progress has been mired by bureaucracy. It took until May last year before the first SET-compliant client software was certified by the independent standards body, SETco (<http://www.setco.org/>). Merchant software came even later.

At the time of writing only five client-side wallet applications were available. Widely used wallets from Microsoft and Sun's Java division were not yet SET-compatible, although the former was enrolled for approval. Until wallets are deployed on every desktop and browser, SET is as good

as "dead", according to Silicon Valley ecommerce analyst Vernon Keenan.

"The reason why SET is a miserable failure is there are no wallets on the desktop," he said when visiting Melbourne last year.

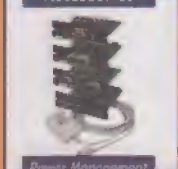
Australian banks largely believed assurances about SET. In the meantime, however, electronic commerce took off without SET, and the banks were slow to develop interim strategies. Desperate for a solution that worked in the present tense, merchants were increasingly attracted to alternative schemes such as secure Web servers that use Secure Sockets Layer (SSL) encryption to safeguard credit card numbers sent across the Net. Payments would then be manually processed as telephone orders.

SET alternatives threatened to shunt banks from their position in the Internet value equation. Ecommerce consultant Aseem Prakash, chief executive of Interactive Knowledge Online (IKO), said banks were missing the boat as Net vendors sought other channels for payment processing. "Banks will lose the primary customer interface if they don't act fast and change their position on the ecommerce food chain," said Prakash, whose clients include major telephone and insurance companies in Australia and the US. Today merchants and consumers are forced to use

From Desktop to Datacenter...

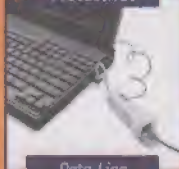
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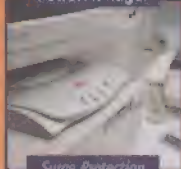
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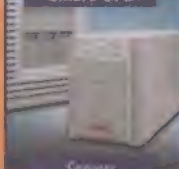
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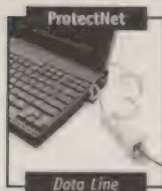


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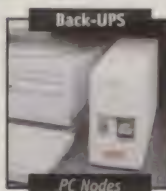
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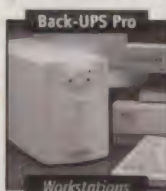
Data Line



Surge Protection



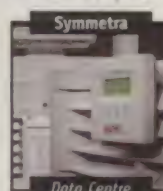
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safest but most expensive option is Telstra's SureLink Internet mall, which is based on the platinum Open Market software from the US. SureLink's costs are a problem, as evidenced by Melbourne music retailer JB Hi-Fi, which withdrew from the service last October following disappointing sales.

"Internet trading is expensive to set up and maintain, and we just weren't seeing a return on our investment," JB Hi-Fi operations manager Gareth Johnson told *Newsire* at the time. "It was simply commercially unviable." Nevertheless, SureLink remains viable for high-value products like computer hardware and Telstra's online phone bill payment service.

The more realistic option for merchants is selling through an authorised gateway — third-party services with bank-approved systems for online credit card processing. Major service providers include Adelaide-based Camtech, Connect, Jadco and Australian Business Access (ABA). Each system provides an interface through to a bank EFTPOS system to provide real-time credit card approval. ABA and Quest Software sell standalone gateway products that can link merchants directly into the banking network. Quest clients include Wool-

merce needs. "The current regulatory environment is not one in which a software developer can invest millions of dollars to create products for local ecommerce businesses," said Paddon. "Our laws have not kept up with the technology."

Restrictions on encryption were also inhibiting consumer confidence in the security of online transactions, Paddon suggested. "Strong cryptography needs to be ubiquitous before consumers will trust Internet vendors," he said. "The lack of reliable cryptography goes some way towards explaining why Australia is trailing the US in ecommerce adoption. Restrictions on encryption impose a massive barrier between people and ecommerce."

Now go cat go

Subtly but undeniably, cracks are appearing in the SET vision. Several banks have approached merchants to trial officially sanctioned SSL systems. ANZ and St George Bank are both supporting a small number of SSL deployments, with merchants assessed case by case. St George electronic channels manager Rick Dore believes consumers are

not have any public pilots. ANZ has conducted internal trials for almost a year, but the Commonwealth Bank recently retreated from SET. General manager of strategic marketing, Gail Kelly, predicted the Commonwealth Bank would unveil its Internet payment solution by midyear. The system is expected to be a hybrid of SSL and Java technologies developed with outsourcing company EDS, but Kelly emphasised the platform would make provision to support SET, should it regain the initiative.

Concerns about merchants storing credit card information mean Westpac does not currently permit SSL products. Jonathan Poole, head of the bank's Internet services, said Westpac was considering allowing SSL systems where credit card data is not stored. But he said the bank's SET plans were well advanced; a closed-loop trial was begun last October, using technology from several vendors. "We're fully behind the SET model," says Poole. For now, he suggested merchants look at options like SureLink and ABA's encrypted Java wallet technology.

Even MasterCard and Visa now recognise SSL as a solid interim measure. "We are quite happy to have merchants using SSL for market building," said Steve Draper, director of ecommerce at MasterCard. He admitted SET was losing momentum, but denied the delays posed an obstacle for Internet business. "Electronic commerce is building, regardless of what anybody does about the payment system," he added. "The payment system has to catch up."

"Banks bought the SET story too quickly," said ABA's Paddon. "Anyone who still buys the argument that SET is just about to happen is a good candidate to buy a bridge." Net commerce is about low barriers to entry, whereas SET always looked like a monolithic answer from big companies who wanted the Internet to go away, he claimed. While overseas banks generally hedged their bets, Paddon said it took a year's work to convince one local bank to experiment with ABA's encrypted Java payment scheme. Now the relationship is becoming smoother.

"Effectively, banking is a club in this country and it's very hard to crack the nut," he said. But SET's failure taught banks that they could not dictate to the online community. "At the end of the day, commercial pressure will win."

The next important step is creating a strong legal framework to validate fundamental ecommerce concepts like digital signatures and email orders, he added.

Bruce Lin, managing director of gateway service provider Camtech, agreed. "Banks were caught on the hop. They

SET's failure taught banks that they could not dictate to the online community. "At the end of the day, commercial pressure will win."

worhs, accounting software developer Data-Tech and Melbourne IT, the Internet domain name registry.

Clearance costs through these gatekeepers are often as high as \$1 per transaction, according to Stewart Carter, editor of the industry newsletter *Electronic Commerce Report*. Some larger ecommerce merchants told APC their costs were closer to 50 cents per transaction, plus bank merchant fees. Carter suggested smaller merchants may be better off finding an ISP prepared to aggregate payment traffic from several Web vendors in order to achieve economies of scale.

Merchant choices are limited partly because the banks were slow to admit SET's stagnation. But Michael Paddon, technical director of ABA, said the Federal Government took too long to provide leadership on fundamental ecommerce issues like the validity of digital signatures and email orders. Without legislation, Paddon said businesses could not enter this "legal grey zone" with confidence. Continued delays raised the likelihood that merchants would import technology to meet their ecom-

comfortable with SSL if they trust the merchant. He said SET was not a key priority for the bank, which has invested heavily in the DigiCash virtual money solution.

"At the moment, SSL is the only viable solution," said Paul Valentine, online payments project manager at National Australia Bank (NAB), which already offers Internet payment clearance based on Quest's Interpay SSL-to-EFTPOS gateway. NAB has had a dedicated team working on SET since December 1997, and a single merchant proof-of-concept trial began late last year. Valentine said the test phase was not without incident, and he conceded SET would struggle to develop a critical mass any time soon. Real revenues could take up to two years.

"There is still a question mark over the value proposition to both card-holder and merchant. Unless both perceive a real value in becoming SET-enabled, it is going to struggle," he said. "In theory, we feel the SET initiative is still the right way to go, but we will need a series of interim steps."

A small number of SET trials are currently active overseas, but Australia does

The statistics.

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were promised SET would solve all the problems, but it won't be widely deployed for two or three years. We can't wait that long and that realisation is getting through," he said. Camtech has developed fruitful partnerships with NAB, St George and BankSA, providing them with

an interim solution based around a proprietary Java wallet and 1,024-bit RSA encryption.

Banks were "over-optimistic" about SET, and too slow to wake up to e-commerce, Carter said. The lack of information filtering down to grassroots levels

encouraged merchants to go online without telling the bank. "We need Australian banks to not just be dragged out there, we need them to be leading the way and helping Australian business get online," Carter said. "It's a brave new era — we're reinventing money." ■

A SET menu: How online payments work

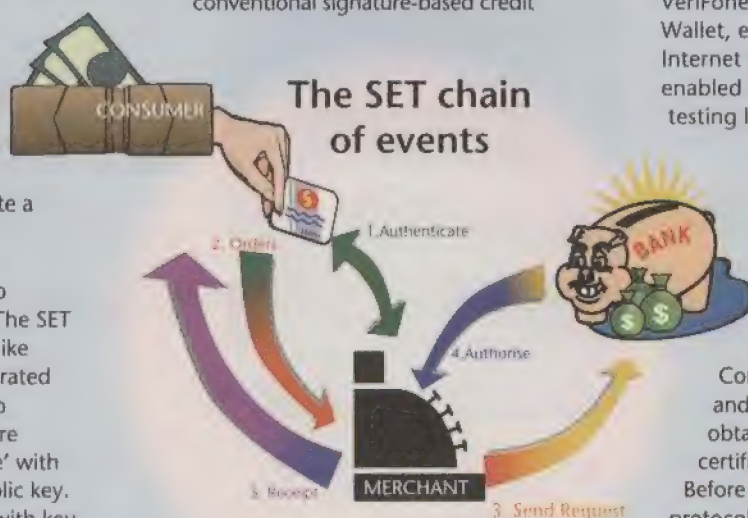
SET is generally regarded as the paragon of online payment systems because its technology covers every posterior. The initial SET 1.0 release defined protocols and algorithms for online payment applications via credit card, while the forthcoming Version 2.0 will prescribe EFTPOS facilities for debit cards by the end of 1999. MasterCard's Draper said a number of European banks want debit facilities added into SET 1.0.

SET uses public key cryptography to authenticate a particular cardholder via a password-protected digital certificate that is assigned to protect an individual card. The SET security architecture works like SSL, using a randomly generated 56-bit DES symmetric key to encrypt message data, before sealing the 'digital envelope' with the message recipient's public key. Public keys are RSA-based, with key lengths up to 2,048 bits. The recipient then uses their private key to open the digital envelope, decrypt the symmetric key and decode the message contents for processing. An innovative dual-signature authentication technique allows both the consumer and the merchant to validate a transaction, ensuring non-repudiation, and an audit trail so card users cannot later deny placing the order.

SET meets banking industry requirements by providing virtually irrefutable proof that credit card transactions were conducted and authorised. Banks need to operate a payment gateway to receive SET requests. The only approved gateway software is an application from US startup GlobeSet that runs on NT or Solaris, although IBM, Fujitsu, Hitachi and several specialist vendors have enrolled products in the SET compliance program. (Current SET status information can be found at <http://www.setco.org/matrix.html>.)

For merchants, the main benefit is

reduced risk. At present, Web vendors carry the can for credit card fraud, and it is a serious issue. It is thought that dodgy credit cards cost almost \$10 million per year for local Internet service providers alone. But the security of SET transfers means banks will assume these risks, as they do for conventional signature-based credit



Source: DSTC

transactions. To participate, merchants need SET-compliant server software that communicates with clients and bank payment gateways to process customer orders. However, at press time, GlobeSet had the only approved server. Approval was pending for three other products, but the only name vendor approaching readiness was Hewlett-Packard's VeriFone subsidiary.

Consumers enjoy protection against both shonky merchants and hackers trying to capture their credit card details. SET client software encrypts a payment request before sending it direct to the financial institution, thereby ensuring merchants cannot tamper with payment figures (see the diagram above). Because merchants never see the credit card information, they cannot store it in their own databases — the place where hackers frequently harvest this data.

To use SET, end users need a client-side wallet program to store various card details and encrypt payment information to send to the SET server. Five wallet products are currently certified as SET-compliant, all for 32-bit Windows, with name vendors including IBM and VeriFone. Microsoft predicted its next Wallet, expected with the final release of Internet Explorer 5.0, would be SET-enabled after commencing compliance testing last September. However, Sun's Java Wallet is not even enrolled yet.

SET also defines proper processes for banks issuing digital certificates, while IBM and GlobeSet certificate-authority software has already passed compliance testing.

Consumers must prove their identity and card ownership in person before obtaining a digital certificate, and one certificate is needed for each card. Before it gets off the ground, the new protocol will face an enormous logistical challenge to distribute tens of millions of digital certificates to cardholders and merchants. Banks will shoulder this burden, and already some European Visa issuers have started handing out digital certificates with new cards. However, it remains to be seen whether the SET rollout happens before alternative schemes emerge.

DSTC's Povey said SET is safer than telephone payments and a better option than SSL because merchants would not see card details. But, in addition to the inherent unreliability of credit card numbers themselves, he questioned SET's scalability. Its public key foundation meant transaction processing performance would always drag down response times.

Moreover, Povey suggested some banks would charge clearance fees for every transaction request, allowing other businesses' competitors to run up costs through failed payment attempts.

Dan Tebbutt

Why don't servers and browsers available outside the US use the strongest possible encryption, and what can Australian users do about it? By Josh Mehlman

Secure your server



One of the major impediments to the global adoption of electronic commerce is a US Government regulation that prevents the export of software using 128-bit encryption. This is because the US National Security Agency (NSA) has traditionally classified cryptography as a weapon of war and restricted the export of almost all cryptography software.

Under pressure from the Software Publishers Association, the NSA agreed in 1992 to allow the export of software using RC4 and RC2 encryption with 40-bit keys. The US Government also recently allowed the export of full-strength encryption software to overseas subsidiaries of US companies and to trustworthy foreign corporations such as financial institutions.

One way to overcome Uncle Sam's export embargo is to publish cryptography source code in a book, a format protected under the US Constitution's freedom of speech provisions. This loophole was exploited to export the Pretty Good Privacy (PGP) encryption application. Another way of avoiding the US export restrictions is to write the software outside the US. This has allowed some Australian companies to profit greatly by writing and exporting their own encryption software. However, Australia is also a signatory to the Wassenaar Arrangement on the export of arms (including encryption), and domestic law imposes major restrictions on cryptography exports.

Protecting yourself with SSL

The most common mechanism to protect transactions on the Internet is the Secure Sockets Layer (SSL) protocol. Originally developed in the US by Netscape, SSL uses X.509 digital certificates and public-key RSA encryption to establish a secure connection between server and client. Once the secure session is negotiated, symmetric encryption is used to transfer data. Symmetric encryption is faster because it uses the same key to encode and decode the data, whereas public keys are normally large (around 1,024 bits) and computationally intensive. So in the case of SSL, the symmetric key used to encode and decode the data is transferred from the

server to the client under public-key encryption.

The version of SSL available outside the US uses crippled versions of the RC4 and RC2 ciphers. Although the keys for symmetric encryption are 128 bits in length, only 40 bits are encrypted using public-key RSA encryption. The remaining 88 bits are sent without encryption. This is effectively the same as using 40-bit encryption, which can easily be cracked.

In June last year, a security flaw was detected in the SSL protocol which allowed hackers, under certain circumstances, to gain access to the symmetric session key, and thereby fraudulently impersonate other users. While this problem was discovered and patched before any serious harm was done, it showed that like almost all cryptographic systems, SSL is not without flaws. Many industry pundits, including the Gartner Group, are predicting a large-scale credit card fraud exploiting the weaknesses of current ecommerce methods.

SSL's position as a de facto standard for ecommerce was recently recognised when the Internet Engineering Task Force (IETF) accepted the protocol for standardisation under the name Transport Layer Security (TLS). TLS is essentially the same as SSL 3.0, but contains no proprietary or copyrighted material.

Server gated cryptography

Now that financial institutions outside the US are allowed to use strong cryptography, many are adopting a technique called server gated cryptography (SGC), which allows users with regular Internet browsers to connect to their bank's Web site using strong encryption. Westpac now uses SGC for its online banking services (<https://olb.westpac.com.au/>). SGC is an extension of the existing SSL and TLS protocols, and works with Microsoft's IIS server. Netscape's CommerceXpert suite uses a similar technique called SSL Step Up. Many browsers are already capable of SGC, such as Versions 4 or higher of Microsoft Internet Explorer and Netscape Navigator for Windows, and Version 4.5 of Microsoft Internet Explorer for Macintosh. When a browser initiates a 40-bit SSL connection to an SGC-enabled server, the server sends back an SGC digital certi-

ficate. The browser verifies that this is a valid SGC certificate and then starts a new SSL session using 128-bit encryption. In order to receive an SGC certificate, banks must fit certain US Department of Commerce criteria. Banks located in countries under US embargo, such as Iraq and Cuba, and several other blacklisted countries, such as Russia and China, cannot receive certificates.

Australia leads the way

Since software written outside the US is not subject to the same restrictions as software written inside the US, server software written outside the US can use 128-bit encryption. Australian software developers Eric Young and Tim Hudson wrote their own open source version of SSL called SSLeay. SSLeay uses 128-bit encryption and has been incorporated in several products including the Apache-SSL server, C2Net's Stronghold server and the Cryptozilla Web browser. However, because SSLeay uses proprietary RSA and IDEA algorithms, there may be legal issues associated with its use in some countries. But Young and Hudson have joined the new Australian division of RSA Data Security and are now developing a commercial international version of SSL, passing on the open source SSL mantle to UK-based OpenSSL group (<http://www.openssl.org/>).

Stronghold is a commercial SSLeay-based Web server package developed by C2Net (<http://www.c2net.com/>) that provides 128-bit SSL, SSL 3.0 and TLS encryption. It is available for Unix, and a Windows NT version is currently in beta testing. Stronghold also makes a plug-in for IIS on Windows NT. A 30-day trial version is available. According to research firm Netcraft (<http://www.netcraft.co.uk/>), approximately 14% of secure servers with valid third-party certificates surveyed in December last year were using Stronghold.

Another option is Apache-SSL by UK developer Ben Laurie, who took the highly successful open source server Apache and combined it with the SSLeay libraries. Apache-SSL can be found at <http://www.apache-ssl.org/>. Netcraft's survey showed about 18% of secure servers surveyed were using Apache-SSL in December last year. ■

How to give your browser added security for ecommerce. By Josh Mehlman

Beef up your browser

There is a strong public perception that financial transactions over the Internet are completely insecure. While this perception may not be entirely accurate or fair, it is true that the level of protection provided by the crippled SSL encryption in browsers imported from the US is less than ideal. So if you do want to make purchases over the Net, there are several options available to beef up your browser to 128-bit encryption.

The first option is to find a US version of Netscape Navigator or Microsoft Internet Explorer. This is quite difficult. Netscape and Microsoft's FTP sites won't let you download the full-strength browsers if your IP address indicates that you're outside the US. Popular download sites such as Tucows and download.com simply redirect you to Netscape or Microsoft's FTP sites. However, Dutch consortium Replay Associates' Web site (<http://www.replay.com/>) has downloadable US versions of Netscape Navigator and Microsoft Internet Explorer for Windows, Mac and Linux. Replay Associates claims that its Web site is protected by Dutch and international law, however it's quite likely that it was illegal for Replay to have exported the US browsers to the Netherlands and it may also be illegal for Australian users to download these browsers from Replay's Web site.

There are several Web browsers that were written outside the US and consequently can use strong encryption. The first of these is the Norwegian-written Opera browser for Windows, which is available from <http://operasoft.com/> and from this month's **apcmag.cd**. Opera is a stripped-down browser that is economical, both with memory and disk space. It supports 128-bit SSL and TLS encryption. On the downside, it doesn't support Java, and the interface could use a little work.

The Brisbane-based Mozilla Crypto Group (MCG) took Netscape's open source Communicator 5.0 code and combined it with the SSLeay encryption libraries to make a version of Netscape Communicator which uses strong encryption, nicknamed Cryptozilla. Although still in development, Cryptozilla is available for Linux and Windows 95 from the MCG Web site <http://www.cryptozilla.org/>, and is on our cover CD.

Encryption plug-ins

If none of these options appeal, there are plug-ins available for export browsers which increase the encryption to 128-bit. One of the most popular is the Fortify plug-in for Netscape, written by Australian developer Farrell McKay, who is also a member of the Mozilla Crypto Group. Fortify makes a few small changes to the Netscape executable program on your computer, and these changes let Netscape use 128-bit encryption keys when connecting to servers that allow strong encryption. Fortify also allows the browser to generate 1,024-bit RSA keys for client certificates, and allows you to send email with 128-bit encryption using the S/MIME protocol. Fortify is free for non-commercial use. You can download it from <http://www.fortify.net/> or **apcmag.cd**.

Another solution is C2Net's SafePassage, which creates a secure connection between the client and server, using any number of encryption protocols, including SSL, TLS

and up to 168-bit Triple DES. In order to connect using SafePassage, both the client and server end need to be running the software. The software then connects the client and server through a specific TCP port and redirects Web communications to that port. SafePassage is very flexible, but works through a command line interface which is a little confusing, and is sold in bundles of 10, so it is obviously not aimed at home users. SafePassage is available for Windows and Unix. The server software costs \$US995, while the client software comes in bundles of 10 for \$US495. A trial version is available from <http://www.c2net.com/>.

Another plug-in for added security is Celo Communications' CeloCom Web Client for Windows 95/98 and NT. As well as allowing Navigator and IE to communicate using 128-bit SSL and 168-bit Triple DES, it also allows you to create your own digital certificate with public and private keys. A demo is available from <http://www.celocom.com/> or from our cover CD. ■

Separating the wheat from the chaff

The limitations placed on the export of strong cryptography from the US have led to a number of development efforts to 'work around' the law. One of the most interesting has come out of the Massachusetts Institute of Technology computer science labs — a system that uses authentication rather than encryption to achieve security goals. It was developed because authentication products have no export restrictions, so there should be no problem with export products based upon the algorithm (that is, until the US government catches up and legislates against it).

Its inventor, Ronald Rivest, calls it chaffing and winnowing, because it is a stenographic process rather than a cryptographic one. Instead of changing the message to make it unreadable without translation, chaffing and winnowing hides the message in the midst of a bunch of useless information. This useless information, which Rivest calls chaff, obscures the message, so that opponents without the means to winnow the data stream cannot read it.

The means is simple — the message is

broken up into packets, and each packet has its own message authentication code (MAC). The authentication system can be any typical authentication system — there are already many implemented. To the packets of 'wheat', packets of 'chaff' are added, with the incorrect MAC but reasonable contents and packet numbers which replicate the numbers of the real message. The receiver, which needs to have the correct authentication key, can read the MACs on each packet and discard the chaff. Others will have to guess which packets are the correct ones — an almost impossible task. Of course, both parties will need the proper authentication key beforehand. Public key style encryption will not be possible.

The actual level of security provided depends on how the algorithm is implemented, but it can be theoretically made virtually unbreakable, according to Rivest. Already there is a GPL test implementation of the algorithm, which, while not suitable for actual application, has proved that it can work.

Nathan Taylor

A look at the latest releases from the world of connected palm, pocket and handheld computers. By Jeremy Torr

Power in your hand

 One thing became obvious the deeper we got into this review. The traditional world of the connected organiser is currently being tipped on its head by a new breed of hybrid machines. These new pretenders still chalk connectivity, not stand-alone use, as their benchmark, but at the same time they think, work and act like real, grown-up notebooks. This does not mean that the days of the palm or pocket organiser are numbered, but that users now have to choose between two sorts of handhelds — those with a keyboard, and those without. Both are dependent on a host PC for major sustenance, both can work on the road and exchange data, but the work each is expected to do is quite different.

Palm potential versus clam capability

The original one-hand, touch screen, shirt-pocket format — Palm Computing's PalmPilot — firmly established the design for the palm PC. That Palm Computing got it so amazingly right first off is proven by the rash of clones from many other makers (Everex, Casio, Royal), with a variety of operating systems under the bonnet. These units have no keyboards, no spreadsheet pretensions and limited peripheral connectivity. But for long battery life, quick and easy use for PIM-type information and total portability, they are unbeatable. With the latest generation of palm units, readability, speed and capacity have all been given a fillip. Handwriting and text recognition is the norm. Not only that, the ability to communicate has also been improved, although those who want to print directly will be disappointed.

The other huge advantage to using a

palm device is their popularity with the developer set. Shareware, freeware and cheapware overflows from hundreds of Web sites, catering for everything from Enterprise Tricorder noise production to bar-code scanning in supermarkets and golf handicapping.

But palm devices are really only valuable to the user as an extension of the desktop PIM or applications. They are limited in terms of serious data entry and screen display, and usually have limited expansion. Enter the CE notebook. This is not to be confused with the first generation of Windows CE pocket devices which had poor battery life, small screens and utterly impractical keyboards. The CE notebook clamshell designs bring touch-typable keyboards,



seamless Net connectivity, good screens, extra peripheral connectivity and sensible battery life in a smaller package than a conventional notebook. And most importantly,



at a much lower cost.

They weigh less, are much more durable (no moving parts) and can do most of what notebook users normally do in real terms, for many hours longer. Also, the ready-to-roll Word, Access, Excel, PowerPoint, Explorer and Outlook will make them attractive to many Office users. The only negatives are the current lack of other applications, and the need to connect to a host to load programs. Otherwise, the future looks very rosy for the likes of the HP Jornada, LG Phenom and Sharp PV-5000A.

Pocket poopers

As in all situations where rapid developments and improvements take place, somebody gets left behind. In this case, the pocket-size clamshell is the loser. These first-generation Windows CE offerings now look positively unwell when compared to second-generation handheld designs. They are too big for the pocket, not big enough for typing on, generally have poor battery life and are way down on connectivity compared to the handhelds. Sadly, they still can't hold a candle to the palm devices when it comes to quick and easy data checking and portability. Even colour screens can't tip the balance — it just makes battery life even worse. The only exceptions are the Ericsson and the Psion. These two have taken specific advantages (IrDA modem and good keyboard respectively) and made the most of them. Otherwise a pocket clamshell is probably not that good a buy right now, given the price and the capability.

Palm III

3COM

3Com's Palm organisers have always been designed for usability rather than ever-expanding feature sets, and consequently the Palm III has no card slots, no voice recorder, no built-in modem and no menu bar. It is a simple 'switch on, use, switch off' notepad that happens to be electronic and can exchange data with a PC or Mac.

The Palm III uses a 16MHz Dragonball CPU with 2M of RAM, working inside a grey plastic case with a 160 by 160-pixel backlit mono touch screen, along with four applet buttons and a power switch. The only other controls are the up/down scroll button and the screen contrast wheel. There is one extra feature which deserves immediate removal and disposal: the lid/screen protector. It is a disgrace to the design team, and is best replaced by cling wrap immediately after purchase.

Back to the good aspects. The usual date, address, to-do and memo apps are complemented by an email update and exchange applet, plus an expenses program which downloads directly into Excel when synchronised with the host desktop. All data entry is via the ROM-based Graffiti text-recognition software using the pop-out stylus, writing in the dedicated letter and number windows at the bottom of the screen. This is reasonably fast once mastered, but takes a few days to really come to grips with.



The only other smart the Palm III offers is an infra-red window, enabling data exchange with other Palm IIIs. Strangely, it can't synchronise or print to other IrDA devices — a definite design fault. Two AA batteries provide power for about one month's average use.

The box contains the synchronising cradle, a whole sheaf of manuals, two CDs, plus offers galore if you sign the registration slip. Swapping between applets and entries is noticeably faster than any of the Windows CE devices reviewed here,

but the menu option still allows some quite advanced editing, cutting, pasting and locating functions. Loading the host software, Pilot Desktop, allows automatic synchronisation of all host and Palm data, plus a reasonable if not stunning ability to manage the usual PIM tasks and email synchronising.

But possibly the greatest asset the Palm has is its support. A vast range of vertical, general and some rather pointless applications are scattered across the Web just waiting to be downloaded, backed up by a whole range of third-party scanners, modems and GPS add-ons for the mobile data collector. If you want something simple and capable yet comprehensive, the Palm III is the one — even if it looks expensive when judged purely on specification.

■ Distributor	3Com
■ Phone	(02) 9937 5000
■ Online	http://www.palm.com/
■ Price	\$699
■ In short	Luckily, 3Com has stuck to its guns — simplicity and dedication to duty are the Palm III's watchwords. Still the benchmark.

Cassiopeia E-11

CASIO

The original E-10 Cassiopeia was the first PalmPilot clone available in Australia. The E-11 ups the ante with twice as much RAM (8M), a MIPS R4000 CPU, a slightly clearer screen, and better Type II CompactFlash compatibility. Oh, and a little pouch too.

It uses a vertically oriented touch-sensitive screen, and has power and applet buttons along the base, plus a scrolling 'Action Control' and microphone button on the left side. There is also an earphone socket, and a CompactFlash Type II slot on the top edge, next to the IrDA window. The cradle is also very similar to the Palm, with an angled slot and a serial plug cable. The hotsync connector protector is a tiny rubber flap which will probably get lost within a week of first being used.

Apart from that, the E-11 works very well. The bundled Jot character recognition system is easier to learn and more forgiving than the Palm's Graffiti, and includes word 'guessing' to speed up data entry. A pop-up virtual keyboard can also be used. The 'Action Control' is a jog/shuttle wheel which allows scrolling and activation by rolling and clicking. This, in conjunction with a separate 'Exit' button, means less fiddly screen tapping. The



EDITOR'S CHOICE

- **3Com Palm III**
- **LG Phenom Express**

Because two basic categories emerged during the review process, we have awarded two Editor's Choices. First, the palm-size devices. In this category, 3Com's Palm III still rules. Thanks to a sizable price drop, its tried and tested interface and extensive software support, it narrowly steals the prize from the Royal daVinci, which is amazing value but has less support and connectivity.

On the handheld front, the LG Phenom Express squeaks in a fraction ahead of the Hewlett-Packard Jornada 820, thanks to its better price, even with the much smaller screen. Honourable mentions go to Casio's Cassiopeia E-11 and the Psion Series 5 for their solid design and value in the middle of the pack.

usual Outlook-compatible calendar, address book and task list are included, plus graphical jotting and voice recording.

Casio has also been very generous with its selection of other applications. These include the smARTCommander Pocket voice command system, a financial calculator, bFax Express, Quicken ExpensAble, Palm Golf, an image viewer, a meeting minder and Harmony. The latter will synchronise the E-11 with Notes, Organiser and ACT desktop PIMs for those who don't want to be tied into Outlook. Although no Explorer is bundled, a Channels applet is provided for offline browsing.

The Voice Recorder offered reasonable quality, noticeably better than the Everex, although without the fast controls of the latter. However, Pocket Commander



seemed to override the Recorder, and kept asking for input commands at inconvenient times. The two AA batteries don't seem to last as long as the Palm III, but the Cassiopeia still offers very good functionality if you respect its limitations. If your needs point you towards an Outlook/CE compatible system which can act as a pocketable personal organiser, the E-11 is well worth looking at.

■ Distributor	Shriro
■ Phone	(02) 9370 9100
■ Online	http://www.casio.com/
■ Price	\$749
■ In short	Well-specified pocket device that offers personal organisation plus good expansion for a reasonable price.

2010c

COMPAQ

The Compaq is heavy and angular, and has really poor battery life, no video or printer connectivity and no built-in modem. It does, however, have the clearest screen of the half-page colour clamshells, a highly usable keyboard similar to the Philips Velo and 20M of RAM. It is also reasonably fast, and comes with a very good set of built-in utilities and downloadable software on the bundled CD-ROM. To top it all off, the manuals are good.

Nonetheless, as a device you can pop in your pocket (if it's a very big pocket) it still leaves the user wanting. The very bright

side, and IrDA window on the back, plus the power and serial ports on the other end.

The main keys are all circular, with good spacing between to speed up two-finger input. A set of hotkeys boot all the usual apps — Pocket versions of Explorer, Outlook, Word, Excel, PowerPoint, but not Pocket Access. The 2010c can be linked directly to the host PC via the sync cable or slipped into the desktop cradle, which also doubles as a security device (it can be Kingston-locked to the desk) with its own luxury stylus holder.

The cradle can be useful if one is doing lots of data entry, because the 2010c (like most of its format) is likely to overbalance when screen tapping. The supplied applications include a graphic scribblepad, a business calculator and a spell checker. The CD adds Pocket Carbon Copy, Mail on the Run, All in Sync, bFax Express and IntelliMigrate — a very well-rounded business selection.

But nothing can remove that battery life from potential users' checklists, and in reality, the 2010c joins the Sharp 4600 (see our Web-only review), constrained by size, power and connectivity limitations. If you love Compaq, it might be worth a look. But when you consider you could get two Casio E-11s for the same price...

■ Distributor	Compaq
■ Phone	1300 368 369
■ Online	http://www.compaq.com/
■ Price	\$1,494
■ In short	Good example of the CE pocket clamshell genus. Sadly, the genus itself isn't that practical.

MC 16

ERICSSON

The MC 16 is a rebadged Hewlett-Packard 360LX with a few extra internal circuits to make it compatible with the Ericsson snap-on IrDA modem. This latter device clips onto the base of any of the latest generation of Ericsson mobile digital phones, and enables direct dialup with no wires or configuration. It's a neat idea, and works even better thanks to Ericsson's free built-in Internet trial software. Select the country and press dial, and you are connected (albeit at only 9,600bps, but hey, it's free). However, for any purpose other than checking email, the MC 16 is rather underpowered.

It does come with Windows CE 2.0, which adds PowerPoint and Excel to the Pocket portfolio, but for Web browsing, the half-size 640 by 240 mono screen is just a bit too cramped, and the slow modem speed obviously doesn't help. The MC 16 is

How we tested

All units were compared on three basic premises: cost, suitability and comparative effectiveness. The latter was deemed particularly important, given recent developments in both operating systems and hardware. Given the aim of the review, fast and simple connectivity to a host was also given high priority, as was the potential ability to provide phone or Net connection on the road. Battery power was also marked highly, as the best-equipped device is no good with a flat battery.

Each unit was initially booted and the basic user setup performed, with a brief run-through of the ROM-based or preinstalled features. Any supplied software was checked and loaded if applicable. A set of contacts, a spreadsheet file, an image and a WAV file were HotSynced or downloaded if possible, and checked for data exchange integrity. Exchange with a variety of PIMs and applications was also checked.

Lastly, a general use and battery life test was run. This rated data entry convenience and speed via keyboard or stylus, ease and speed of selecting or changing applications, host synchronisation or Net access, and use of specific controls or facilities.

supplied with two AA NiMH rechargables which keep things ticking for about 12 hours; not bad comparatively.

Design-wise, the MC 16 is very traditional — the usual two-finger keyboard, clamshell layout, with a PC Card slot on the left-hand side and a CompactFlash slot on the right-hand side. The right-hand side also houses the IrDA window, and the back offers power-in and serial host socket.

The MC 16 is not very easy to balance. Open the lid to a normal angle and it immediately tips over, but to offset this, the makers have supplied a very chic

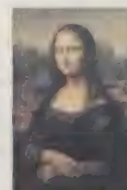


and sharp 256-colour 16.5cm diagonal backlit touch screen and 20M of RAM use enough gas to make the 2010c get quite hot, and even the special NiMH battery pack pegs out after a couple of hours of solid use. That is poor indeed for a CE device — most power notebooks do better.

The case itself looks more like a jewel case than a pocket computer, with a couple of buttons on the front for microphone and alarm, a Type II PC Card slot on the



a woman
 seated
 in a
 low-cut dress
 of velvet
 dark eyes
 long straight
 brunette hair
 she is smiling
 almost imperceptibly



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leather wallet case to both keep it in and keep it stable. The wallet also houses the clip-on phone modem.

Another extra is a 2M CompactFlash card which is thrown in gratis, along with a backup applet to save data to the card. The bundled software is enough for basic tasks — a special My Ericsson Phone applet that pulls all connectivity and phone details from Outlook into one place, plus bFax and the Ericsson Internet connection.

The manuals, especially for the modem, are terrible. All escape codes and AT commands (which you can't access through the MC 16 anyway), and no troubleshooting at all. Luckily, the IrDA system works seamlessly. Given the modem, the wallet and the extra 2M CompactFlash backup card you get thrown in, it's not a bad bundle, and it's easy to use too. The MC 16 is worth looking at if you want a ready-to-go bundle with no pretensions to data entry, all-round connectivity or big screen productions.

Distributor	Ericsson
Phone	1300 650 050
Online	http://www.ericsson-mobiles.com.au/
Price	\$1,599
In short	Limited in scope by keyboard and bundled software, but does its job well enough.

Freestyle

EVEREX

The Everex Freestyle is almost a dimensional twin of the Palm III, but it uses Windows CE 2.0 to offer a much broader range of functions, expansion and controls. The case is a dark charcoal plastic with the usual 240 by 320 backlit mono touch screen and buttons everywhere. It's all packaged in a smooth leather pouch.

On the left-hand side are brightness and contrast buttons, plus an earphone and voice recorder. On the right-hand side are the Stop/Esc button, a unified Up/Down/Enter bar and the power switch. A microphone, speaker and pop-out stylus also manage to squeeze in. There is also a comms port, a DC power-in, a Type II CompactFlash slot and an IrDA window to communicate with other Windows CE devices. Not much room is spare around the edges, and this can be a nuisance when inserting the unit into its cradle — it's very easy to accidentally activate one of the applications just by gripping the case.

The good news is the cradle isn't essential. The serial connector can be plugged



directly into the Freestyle — as can the power supply for the two NiMH AA rechargeables. The cradle can also house its own batteries to save power when synchronising. Inside, the system houses 8M of RAM and a MIPS R4000 CPU, although the blurb claims there is an NEC chip. The package comes with a separate power supply, a very sparse manual and a CD-ROM with bundled software.

The latter includes some seriously practical apps including ExpensAble, the very neat bTask program manager, and CalliGrapher, a handwriting recognition utility. The standard address, notes, tasks and calendar applications plus Web Channels are available, along with Jot handwriting recognition and a calculator. The Freestyle also includes a clever 'vibrate on alarm' function which is great for unobtrusive reminders. However, if you intend to use lots of voice notes, the Freestyle is not your gadget. Sound quality through the embedded microphone was not a patch on the Cassiopeia E-11 or Jornada 820.

The screen has a slightly matte finish which makes character input much crisper than the Casio, but blurs the image slightly. Apart from all those buttons making unexpected program selection, the versatile battery and connection options (a modem-equipped cradle is also available) make the Everex well worth investigating.

Distributor	Tech Pacific
Phone	(02) 9381 6000
Online	http://freestyle.everex.com/
Price	\$799 (approx.)
In short	Neat design and clever functions, but its style is cramped by fiddly controls and a dim screen.

Jornada 820

HEWLETT-PACKARD

The Jornada looks very slick, with its superb screen and the instant-on Windows CE Pro Version 3.0. And in terms of mobile computing capability, it certainly

does the job. But in terms of a personal assistant, it's overkill.

However, if you regularly curse your notebook for being heavy, terrible on batteries and only good for Word documents, checking emails or spreadsheet tinkering while away from the office, the Jornada is the perfect solution. Inside the elegant grey clamshell case is one of the best keyboards in its class (which actually boasts a Euro symbol), an impressive 21cm diagonal, 640 by 480 pixel, 256 colour screen, a touchpad mouse, and a set of major application hotkeys. A decent speaker and microphone also nestle under the wrist rest. Both CompactFlash and PC Card Type II slots are fitted, and the rear houses an IrDA window, VGA video-out socket, USB and an RJ11 modem socket — comprehensive to say the least.

Inside there is a StrongArm 190MHz CPU, backed up by 16M of ROM and 16M of RAM and powered by the lithium-ion battery which sits under the keyboard, providing good balance. No stylus is supplied as the screen is not touch-sensitive,



but this makes it brighter than most of the others. Applications and files load with impressive speed.

The touchpad is surprisingly usable given its size, and together with the keyboard, enabled fast data entry. Hewlett-Packard has loaded pocket versions of Word, Excel, Access, Explorer and PowerPoint, as well as ActiveSync to link to the host desktop, plus bFax, Voice Recorder, its ubiquitous HP Calculator and more.

But most important is the HP Dialup utility, which allows the fastest and simplest Net registration. Simply connect a phone line, enter your dial-up number and basic user details, and you are immediately connected via the internal 56K V.90 modem. The other aspect which makes the Jornada appealing is its battery life. Although it uses a non-standard battery format which requires a separate power supply, its normal operating life of about

10 continuous hours (around two working days) per charge means most users won't need the power supply on the road.

As a pocket device, the Jornada is too smart, too sophisticated and too expensive. But as a compact, economical notebook alternative, it's about the best product there is right now.

■ Distributor	Hewlett-Packard
■ Phone	131 347
■ Online	http://www.hp.com/jornada/
■ Price	\$1,999
■ In short	Cleverly crafted CE Pro device, but more a notebook replacement than a connected organiser.

Phenom Express

LG ELECTRONICS

While the Sharp PV-5000 disappoints by including less than the case suggests, the LG Phenom is the exact opposite. Although it is verging on pocketable, it includes a decent keyboard, the usual PC Card expansion, a built-in modem, voice recording, VGA video-out, a replaceable battery and even a Centronics port for direct printing (although the print driver isn't exactly typesetter quality). That's pretty good for a pocketable item.

Inside the Phenom is a Hitachi SH-3 chip running at 100MHz, plus 16M of RAM (32M maximum) for data, which provides reasonable, if not blazing, speed. There are also some really useful applications such as Expenses and pcAnywhere (and Golf) on the bonus software CD.

OK, there had to be a slight catch, and it lies in the screen. It only offers half-screen 640 by 240-pixel resolution in 256 colours across 20.5cm of diagonal space — although it is a couple of centimetres wider than usual, which means normal icon size. The touch membrane also makes it a tad less crisp than the Jornada, and some space is gobbled by the nine hot-touch spots for Pocket Office apps, PIM applets, a system set-up wizard and so on.

The designers have obviously worked hard on the Phenom, and built some really neat features into the smooth grey and silver casing. The removable lithium-ion battery (which provides about nine hours battery life) sits in a cylinder just behind the screen hinge, but also cleverly flips down to form a rest for keyboarding and to add support for stylus tapping. The two ends of the battery cylinder house an RJ11 socket and speaker respectively, and when hinged right down the VGA-out and DB25 printer ports are exposed.



Design and feature-wise, the Phenom is hard to fault. However, the rear-mounted battery does make it a bit wobbly on the lap, and although the excellent keyboard is up there with the Jornada, it doesn't have a wrist rest to make it as comfortable. The ConnectForce applet which promised to connect to any ISP faster than a wink was (on the review sample) only equipped to deal with US ISPs, but the internal V.90 modem seemed to do the job adequately, and will auto-configure to most countries using built-in software. The standalone voice recorder has a simple one-touch record system, and produced surprising quality WAV files when played back via the host PC (not via the tiny built-in speaker — to say it's basic is a compliment). But even with these few niggles, the Phenom Express is still a superbly integrated and very workable mobile unit.

■ Distributor	LG Electronics
■ Phone	(02) 9888 1311
■ Online	http://www.lgphenom.com/
■ Price	\$1,299 (approx.)
■ In short	Excellently balanced product featuring good design, reasonable performance and a realistic price.

Nino 300

PHILIPS

One thing you have to say about Philips' Nino is that it looks very, very cool. Based on a palm format, it uses standard Windows CE vertical orientation for the 240 by 320 backlit mono screen, but a designer plastic insert which hides the speaker replaces the usual button array. This is a better design than the Freestyle and Cassiopeia, which both have speakers on the back where your hand muffles the sound.

The sides of the Nino are flanked with groovy sculptured rubber inlays that help you grip the unit for one-hand use. This is assisted by the custom action buttons

recessed in the inlays. There is a scroll/action button set on the left-hand side, and a set of four application buttons on the right. The top holds the stylus, the CompactFlash slot and an IrDA window for data exchange. The only other external features are a cradle contact strip and direct serial port on the bottom, a contrast control, and a power socket for rejuicing the supplied NiMH batteries. Philips has taken a belt-and-braces approach here, and made the unit AA-compatible, but it includes rechargables and a power supply as well. All this makes the Nino slightly bigger and heavier than most palm units.

The kit comes with a slick-looking cradle, an application CD, and a very thin manual. The screen has less contrast and clarity than the Palm III and Freestyle, even with the green backlight activated. The usual Pocket Outlook applets are included, plus Voice Recorder, Web Chan-



nels and smARTCommander voice control. Bundled software amounts to a copy of Expense Manager and that's it. The ROM-based Tegic T9 word guessing applet is a bit of a fizzer, and in most cases Windows CE Jot is much faster.

In use, the Nino seemed a bit slower than some of its Palm competitors, and the rechargables' battery life was a bit less than alkalines. Theoretically the one-touch, one-hand buttons are great, but in use they are less practical. Button spacing is critical, and they seemed a bit far apart for smooth use without juggling. On the plus side, the Nino is truly ambidextrous — a boon for left-handers — and can record voice notes while it's still in its carry pouch. Plus it does all the usual Windows CE palm things as well as any of the competition.

Overall, a brave attempt to bring palm computing into the fashion accessory arena. However, given the price, the screen, and those almost-one-handed operation buttons, the Nino is still more a fashion accessory than a tool.

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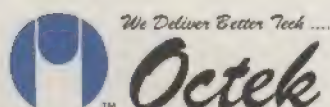
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Handhelds: Vital statistics

Product	3Com Palm III	Casio Cassiopeia E-11	Compaq 2010c	Ericsson MC 16	Everex Freestyle	Hewlett-Packard Jornada 620
Distributor	3Com	Shiro	Compaq	Ericsson	Tech Pacific	Hewlett-Packard
Phone	(02) 9937 5000	(02) 9370 9100	1300 368 369	1300 650 050	(02) 9381 6000	13 13 47
Online	http://www.palm.com/	http://www.casio.com/	http://www.compaq.com/	http://www.ericsson-mobiles.com.au/	http://freestyle.everex.com/	http://www.hp.com/jornada/
Price	\$699	\$749	\$1,494	\$1,599	\$799 (approx.)	\$1,999
OS	Pilot OS 3	Windows CE 2.0	Windows CE 2.0	Windows CE 2.0	Windows CE 2.0	Windows CE Pro 3.0
Screen	160 by 160 mono backlit	240 by 320 mono backlit	640 by 240 colour backlit	640 by 240 mono backlit	240 by 320 mono backlit	640 by 480 colour backlit
Input	Stylus	Stylus	Stylus, keyboard	Keyboard, stylus	Stylus, virtual keyboard	Keyboard, touchpad
Standard RAM	2M	8M	20M	8M + 2MCF	8M	16M
CPU	Motorola Dragonball	MIPS R4000	MIPS R4000	Hitachi SH-3	MIPS R4000	StrongArm 1100
Expansion	ir/a	CompactFlash	PC Card	PC Card, CompactFlash	CompactFlash	PC Card, CompactFlash
Batteries/approx. life	2x AA alkaline, 4 weeks	2x AA alkaline, 20 hours	2x AA NiMH, 3 hours	2x AA NiMH, 12 hours	2x AA NiMH, 20 hours	Li-Ion rechargeable, 10 hours
AC Supply	No	No	Yes	Yes	Yes	Yes
Comms	HotSync	WinCE serial, IrDA	WinCE serial, IrDA	WinCE serial, IrDA, modem	WinCE serial, IrDA	WinCE serial, IrDA, VGA, USB, modem
Applications *	Expenses, email	smARTCommander, Pocket, bFax, Golf, ExpensAble	Spell Check, QuickNotes, Carbon Copy, bFAX, InSync, IntelliMigrate	Myphone, bFax, MobileInternet	bFax, ExpensAble, CalliGrapher, bTask, MobileNEWS	bFax, Image Editor, Dialup
Sound	Beep	Voice recorder, speaker	Voice recorder, speaker	Speaker	Voice recorder, speaker	Voice recorder, speaker
Size/Weight	120 by 81 by 18mm, 170g	124 by 82 by 18mm, 186g	190 by 100 by 32mm, 438g	187 by 94 by 29mm, 442g	122 by 80 by 16mm, 115g	245 by 180 by 32mm, 1,130g

* All units include address, memo, calculator, calendar and to-do lists. WinCE units include Windows CE, Pocket Word, Excel, Explorer, Scheduler and Calendar.

- **Distributor** Philips
- **Phone** 1800 144 733
- **Online** <http://nino.philips.com/>
- **Price** \$849
- **In short** Very slick design and battery options, but the screen could be better.

Velo 500

PHILIPS

When we first reviewed the Velo (see APC September 1997, page 87), it came out on top for its innovative blend of communications, expansion, voice recorder and almost usable keyboard. Since then the rest of the pack have caught up, equalled and overtaken the Velo — even in its latest 16M, Windows CE 2 guise.

Despite some valiant efforts to upgrade the Velo, it still lags in the feature stakes. That's not to say the Velo 500 isn't a very well-designed unit for a pocket clamshell CE device. The case looks even smoother than the Psion, with a temptingly tactile moleskin finish. The exterior carries a voice-recorder button on the lid, LED lights for alarm, sync and battery, an IrDA window, power-in, a subminiature serial con-



nection port, a pop-out stylus, and a connection for the optional custom modem. The bottom of the case hides two Compact Flash expansion sockets, the speaker and the battery release toggle.

The Velo 500 is supplied with two rechargeable NiMH AAs, but like the Nino, they can be replaced by standard AA alkalines if necessary. A charger is included in the box, along with the rather bloated host PC docking cradle which merely takes up desk space and connects via the serial port.

The Velo has a reasonable size 640 by 240 half-page display, but its mono output is not terribly easy to read, even with the green backlight on — partly due to its low contrast. The attractively laid out keyboard, although too small for touch-typing, uses small, highly separated rounded

buttons which make hitting the wrong key much less likely.

CD-ROM-based software is rather thin on the ground — Tetris 2 and Virtual Courier are all you get. However, the Velo does include bFax, a database, a file viewer, a keyboard mapper, a find utility and a conversion applet in ROM, so it's not all bad (as well as the usual Pocket Office applications such as Excel, Word, PowerPoint but not Access). No handwriting recognition applications are included.

The Velo was mid-field when it came to speed and battery life, and had fair balance in the hand. However, the rear-mounted battery didn't help stability on wobbly surfaces. An optional external V-Module can be snapped onto the bottom of the unit to take PC Card expansion or modems.

Like the Sharp 4600 (see our Web-only review), the Velo underlines how far mobile computing has come in just over a year. Without a built-in modem and a colour screen, the Velo 500 is not really up with the leaders. Although it is a practical and attractive tool, and a lot more pocketable than Ericsson's MC 16 and Compaq's 2010c, it needs more than a simple memory boost to keep up with the market leaders.

Handhelds: Vital statistics

Product	LG Electronics Phenom Express	Philips Nino	Philips Velo 500	Psion Series 5	Royal daVinci	Sharp PV-5000A
Distributor	LG Electronics	Philips	Philips	Vodafone	Smart Products	Sharp Australia
Phone	(02) 9888 1311	1800 144 733	1800 144 733	(02) 9415 7000	(03) 9853 9388	1300 304 075
Online	http://www.lgphenom.com/	http://nino.philips.com/	http://velo.philips.com/	http://www.pSION.com/	http://www.royal.com/	http://www.sharp-au.com.au/
Price	\$1,299 (approx.)	\$849	\$1,429	\$1,099	\$299	\$1,899
OS	Windows CE 2.1	Windows CE 2.0	Windows CE 2.0	EPOC32	daVinci OS	Windows CE Pro 3.0
Screen	640 by 240 mono backlit	240 by 320 mono backlit	620 by 240 mono backlit	640 by 240 mono backlit	160 by 160 mono backlit	640 by 480 colour backlit
Input	Keyboard, stylus	Stylus	Stylus	Stylus, keyboard	Stylus, virtual keyboard	Keyboard, stylus
Standard RAM	16M	8M	16M	8M	256K	32M
CPU	Hitachi SH-3	MIPS R4000	MIPS PR31700	ARM7100	Motorola Dragonball	MIPS 3000
Expansion	PC Card	CompactFlash	2x CompactFlash	CompactFlash	n/a	PC Card
Batteries/approx life	Li-Ion rechargeable, 9 hours	2x AA NiMH, 12 hours	2x AA NiMH, 12 hours	2x AA alkaline, 35 hours	2x AA alkaline, 5 weeks	Li-Ion rechargeable, 7.5 hours
AC Supply	Yes	Yes	Yes	Optional	No	Yes
Comms	WinCE serial, IrDA, VGA, USB, printer, modem	WinCE serial, IrDA	WinCE serial, IrDA	PsiWin Sync, IrDA	SmartSync, keyboard	WinCE serial, IrDA
Applications *	Golf, email, Expenses, pcAnywhere, Connect	Commander, NoteTaker, smARTwriter, Expense manager	Voice recorder, Expense manager, bFAX, Database	Spreadsheet, Present, Sketch, Voice, Web	FlashNotes, Clock	Image editor, bFax, bBackup, bView
Sound	Voice recorder, speaker	Voice recorder, speaker	Voice recorder, speaker	Voice (WAV), beep	Beep	Speaker
Size/Weight	237 by 150 by 26mm, 830g	135 by 87 by 20mm, 220g	172 by 95 by 33mm, 425g	172 by 89 by 24mm, 350g	127 by 87 by 18mm, 170g	237 by 200 by 38mm, 1,220g

* All units include address, memo calculator, calendar and to-do lists. WinCE units include Windows CE, Pocket Word, Excel, Explorer, Scheduler and Calendar.

- **Distributor** Philips
- **Phone** 1800 144 733
- **Online** <http://velo.philips.com/>
- **Price** \$1,429
- **In short** Excellent design and good ergonomics, but lacks connectivity.



Series 5

PSION

Psion came up with the first handheld data organisers way back in the early 1980s, and despite not wooing the Microsoft camp, it has managed to hold on to a large slice of the market ever since. The latest, the Series 5, is a masterpiece of design and production allied with some quirky British approaches to usability.

The case is amazing. Open the clamshell lid and the keyboard slides forward, pulling the bottom of the screen with it into the perfect typing/viewing position. This action also puts the weight in the ideal place for stable usage. The 14.5cm screen is notably bigger than most pocket units, and has 640 by 240 backlit mono pixels. The icons and fonts, scroll bars and touch dialogs are all more readable than Windows CE alternatives.

Adding to all this excellence are the applications held in 6M of ROM. The 32-bit EPOC OS runs Word, Sheet, Data, Agenda, Time, Calculator, Sketch, Spell, Program, Record, Web and Email too. Most of these also have hotkeys for one-touch activation. Externally, the Series 5 offers one Psion/CF expansion slot (in addition to the existing 8M of RAM), an IrDA window, a microphone and speaker, an RS232 mini slot for the synch cable, external sound-recording controls, and a slot for the stylus.

The keyboard action is another plus, with good feedback and more usable layout and spacing than all but the biggest Windows CE units. The package includes the PC connect cable, and a CD-ROM which houses the PsiWin host software. This links quickly and automatically with

the host PC and offers transparency with most office applications in popular use.

Also in the box is a rather disappointing manual. Although it goes into great detail about the applications, there is only extremely cursory treatment of such essentials as expansion, printing connections, and linking to mobile phones, and no mention at all of how to use email or the Web. Given these are often major reasons for buying such a unit, this is astounding.

Another peccadillo is the way sound is recorded. Instead of individual files, all consecutive recordings are lumped together in one string, and if you delete, everything goes West in one hit. Not very user-friendly. Which is strange, because in almost every other aspect, the Psion is superb. Despite the gripes and given its size, the Series 5 offers a very powerful package, comes with as much truly usable software as most notebooks, and above all looks very smooth.

- **Distributor** Vodafone
- **Phone** (02) 9415 7800
- **Online** <http://www.pSION.com/>
- **Price** \$1,099
- **In short** An excellent all-round buy, as long as you can cope with the manual.

daVinci

ROYAL

Royal obviously thinks its 'palm-size organiser' is pretty good — naming it after Leonardo is a big call. Luckily, it has Italian flair and innovative design aspects on its side, such as a magnetically retained flip-up lid, finger hold/stylus slot, and a sculptured shape which avoids sharp corners. Although it is as close to a Pilot clone as you can get without involving lawyers, it brings enough individuality to merit a close look.

The daVinci comes with the usual docking cradle which connects to a serial port, a host software PIM, and a couple of slim manuals. Batteries are two AA alkalines plus a button backup. Powering up reveals an 8.5cm, 160 by 160-pixel backlit mono screen, a hello message and a set of touch-sensitive icons. At the bottom of the screen are textual and numeric entry patches plus more icons for tools, OK and cancel actions. Buttons below the screen enable clock, search and scrolling, and the on button doubles as a backlight switch if held down. Inside is a Motorola Dragonball CPU and 256K of non-expandable RAM.

Entering information is performed one letter at a time using the bundled daVinci Script. On our test model this seemed slower than Graffiti or Jot, and more prone to incorrect interpretation unless very scrupulous hieroglyphs were entered. The layout of both the address book and cal-



endar (Planner) is very clear, with a bold display and good use of tabs to avoid CE-style cluttered screens. The clock applet offers the choice of one local and one remote time zone setting. The unit also offers a basic sketch applet it calls Notes, but the results of this cannot be transferred to the host PC at synchronisation.

Some operations were a bit confusing, for example the need to tap the Tools icon prior to a new entry, and the lack of button-controlled calendar scrolling. The host PC software is

less crisp in both appearance and use than some others, with no clipboard or export/import ability.

However, the range of standard records is good, with all the usual alarms, date reminders and so on that most mobile users would want. Our review sample did turn up a reluctance to enter post-pm times on the host software (no problem on the daVinci itself) but this could have been a pre-production glitch.

Although not supplied as standard, an innovative plug-in, pocketable folding keyboard makes the daVinci a really useful standalone package. Its main disadvantage is the current lack of third-party and shareware support. If it does attract more software and peripherals (such as printer cables or modems), the daVinci could be a real winner in the pocket stakes.

- **Distributor** Smart Products
- **Phone** (03) 9853 9388
- **Online** <http://www.royal.com/>
- **Price** \$299 (folding keyboard about \$100 extra)
- **In short** Nice design, solid applications, but little third-party support as yet. Still, a real bargain for the vanilla user.

PV-5000A

SHARP

If you took an HP Jornada, added a bit of silver finish here and there, replaced the touchpad mouse with a touch screen and put a Sharp logo on the outside, you wouldn't be far from the Sharp PV-5000A. Sharp obviously agrees with Hewlett-Packard about Windows CE's future, and decided the mini-notebook form factor is the one to run with.

Inside the clamshell case is a 4,096-colour, 640 by 480-pixel touch screen of identical size but less clarity than the Jornada, plus a noticeably more congested keyboard than either the Jornada or Phenom. Around the back there are no ports at all, thanks to the non-removable battery which projects beyond the screen hinge line to help balance the unit. The sides house a Type II PC Card slot, the serial interface and an IrDA window. Although there is a space for a modem output, none is fitted. Inside the case, the Sharp offsets this relative paucity of slots and comms with a 148MHz MIPS 3000 CPU and a whopping 32M of RAM. These produced the fastest loading and running speeds of any of the units.

The usual Windows CE Pro Pocket Office apps (Word, Excel, Access and PowerPoint) are included, with the omission of the Voice Recorder — no sound-recording capability is included. The range of software supplied is good, with image editor, fax, sketching and backup apps plus a dedicated file viewer. The package comes with a second CD in



addition to the Windows CE Pro disc, which adds applets for Sharp's special PC Card camera, image viewer and MPEG-player applets.

The PV-5000A's screen was as fiddly to use as the wallet-size Windows CE units, which negated the faster processor and more RAM, but the size still made it as bulky as some notebooks. The dedicated application launch keys across the top of the keyboard and the forward-placed screen hinge compound the squashed-up feel of the keyboard. Expansion and I/O are way down on the Jornada and Phenom, both of which compete head-on in the CE Pro notebook/laptop category, and the fact that the battery is non-removable and has less longevity (about seven hours in real-life terms) means reduced capability on long journeys.

If the PV-5000A had video, printer and modem outputs, a bigger keyboard and a removable battery, it would be really good. It doesn't. Although it looks very similar to the Hewlett-Packard (apart from the battery lip hanging out the back), it really only beats it on internal tech specs. For only slightly more money, you can buy into the entry-level notebook league, with not much penalty on size yet much more flexibility and usability.

- **Distributor** Sharp Australia
- **Phone** 1300 304 075
- **Online** <http://www.sharp-au.com.au/>
- **Price** \$1,899
- **In short** A mixture of useful and curious design features. Capable, but restricted in equal measure.

If it had a Universal Serial Bus plug on the end of the cable, APC reviewed it. By Josh Mehlman

To USB or not to USB?

The last six months have seen unprecedented growth in the number and variety of USB peripherals on the market. Although USB peripherals can be used on Macs and PCs alike, the current proliferation of USB devices is no doubt due to the success and popularity of Apple's iMac. Apple gambled that once a computer that needed USB peripherals came onto the market, the peripherals would soon follow. The gamble paid off; a huge range of iMac-centric USB peripherals debuted at the recent Macworld expo.

Beginning late last year, the number of USB devices available in Australia began to climb rapidly, and the pace appears to be accelerating — so we decided to sample what's now available to consumers. While APC's reviewers were writing this feature, new products were becoming available at the rate of more than two a week.

How does USB work?

USB was developed by seven leading PC and telecommunications companies: Compaq, Digital, IBM, Microsoft, NEC, Northern Telecom and Intel. The impetus to develop USB came from the need for a standard that would simplify computer/telephone integration and videoconferencing, both of which required more bandwidth than was available using the serial port.

Of the four wires in a USB cable, two are used to carry power and the other two carry data using differential signalling. Differential signalling works by measuring the difference in voltage between the two wires, and is less prone to error than the traditional method of reading if the signal is on or off. When a new USB device is plugged in, the voltage level in one of the signal wires changes, which alerts the USB controller chip in your computer that a new device has been plugged in. The device tells the USB controller which kind of device it is, and transmits a unique number that identifies itself. The controller assigns the new device an address, then passes this information on to the operating system. The OS either recognises the device and loads the drivers, or, if it's the first time this

device has been plugged in, asks the user to provide a driver.

The principal benefits of USB are well known. USB has a data transfer rate of 12Mbps, although some peripherals such as keyboards and joysticks connect at 1.5Mbps. It allows up to 127 devices to be connected to a single port through daisy chains and hubs. Peripherals can be attached and removed while the computer is still running, and the computer recognises the devices and loads the drivers without having to reboot. The USB cable carries power as well as data, so some devices do not need external power, and cables can be up to 5m long.

This has advantages for both PC and Mac users. PC users no longer have to worry about IRQ settings and other fiddly parts when connecting peripherals to a PC. Mac users have never had to worry about these things, thanks to Apple's proprietary ADB interface, but the number of Mac peripherals has traditionally been fairly low, because manufacturers were reluctant to produce a separate product for a niche market. USB devices can be used with both Mac and PC, as long as appropriate drivers are written. But

although it would seem an obvious good move to write drivers for both Mac and PC, several manufacturers have ignored or deliberately excluded either the Mac or PC side of the market.

Does it work?

USB devices work with Windows 98, Windows 95 OSR 2 (also known as Windows 95 revision B) and all versions of Mac OS after Version 8.1. While we expected all sorts of hitches and problems in plugging in and configuring USB devices, for the most part there were no problems. It was a matter of plugging in the device, and then telling the computer where to find the drivers. It was sometimes necessary to restart the computer after the drivers were installed. Alternatively, you could install the drivers first, restart the computer if necessary and then plug in the USB device. While much fuss is made of USB's daisy-chaining capability, none of the products we reviewed had extra ports to daisy-chain peripherals. If you have more devices than USB ports, you would need to invest in a hub in order to plug them in.



● CAMERAS

DC260

KODAK

The Kodak DC260 currently sells for \$2,449, which is expensive for a digital camera. You would expect an awful lot for that amount of money, and the DC260 delivers.

It has a 38 to 115mm zoom lens, autofocus and a built-in flash. It takes four AA batteries, which run out fairly quickly, so it's a good idea to plug it in to the AC adapter when you're transferring files to your computer.

The DC260 can store anything from 16 high-quality pictures to over 90 low-quality pictures in its 8M flash memory card. It supports resolutions of up to 1,536 by 1,024 pixels. The picture quality was very impressive.



Once you have installed the drivers, you can connect it to your PC through either the serial port or the USB port. As expected, transferring files through USB was much faster than the serial connection. Under Windows 98, once the drivers are installed, the camera shows up as a system folder in Windows Explorer, and

you can move, copy and delete files from the camera's memory. The camera also comes with Picture Easy software which you can use to transfer, catalogue and edit your pictures. Under Mac OS, you can only transfer the files by using the provided plug-in for Photoshop or other image editing software, which is much less convenient.

Josh Mehlman

■ Distributor	Kodak
■ Phone	1800 674 831
■ Online	http://www.kodak.com/
■ Price	\$2,449
■ In short	USB adds speed and convenience to this great digital camera.

DVC323

KODAK

'Star Trek' fans will instantly recognise the influence of the phasers from the 1960s TV series on the design of the DVC323. As well as a tripod mount, the DVC323 has an impressively solid stand with a tilt control.

Kodak's DVC323 would easily have been the best videoconferencing camera we reviewed, but for one small detail: it doesn't come with a microphone. Both the Logitech and the Philips cameras have a microphone incorporated into the camera housing, which adds a measure of convenience to videoconferencing.



The colours were fairly accurate, and the picture was sharp and overall very pleasant. Of the three cameras we tested, the DVC323 was the least capable in low-light situations. Unlike the Logitech QuickCam Home, the DVC323 took impressive still pictures at 640 by 480 resolution. It also has three zoom settings, allowing you to adjust the picture from wide-angle to telephoto.

The bundled software was very good. PictureWorks Live is well designed for making still pictures and video clips. Also included were Kai's Power Goo SE and PictureWorks NetCard. Like all the

videoconferencing cameras in this review, the DVC323 comes with drivers for Windows only.

Josh Mehlman

■ Distributor	Kodak
■ Phone	1800 674 831
■ Online	http://www.kodak.com/
■ Price	\$352
■ In short	Excellent picture, but needs a microphone.

QuickCam Home

LOGITECH

Logitech's QuickCam Home is Logitech's consumer-focused videoconferencing camera. It's very small, very cute and it mounts on a small bracket that sticks to the top of your monitor. This lets you tilt and pan the camera, and positions it a little lower than most monitor-top mountings, putting the



camera almost exactly at eye level. This provides a more natural and flattering picture when videoconferencing.

The QuickCam Home can manage up to 352 by 288 resolution for video and up to 640 by 480 for still pictures. The picture quality wasn't bad, although the colours looked a little washed out. The still picture quality was less than impressive, except in the 320 by 200 'enhanced' mode. The sound quality of the built-in microphone was surprisingly good, and filtered out quite a bit of the background noise.

Like most of the USB devices in these reviews, it was just a matter of installing the software, restarting and plugging it in. The QuickCam Home does not come with drivers for Mac OS, although other Logitech cameras do have Mac drivers. The Logitech CamWare software that is bundled with the camera was very easy to use; it helps make, catalogue and save pictures and video clips.

Josh Mehlman

■ Distributor	Logitech
■ Phone	(02) 9972 3711

How we tested

To review USB peripherals, we connected each device to a Dell Dimension XPS R450 with a 450MHz Intel Pentium II processor running Windows 98, and/or to an Apple iMac with a 233MHz PowerPC G3 processor running Mac OS 8.5.1 with the latest iMac firmware upgrade and the iMac Update 1.1 installed. As well as looking at how the product worked in general, APC's reviewers looked at how easy it was to install the device and the drivers, and how well the system recognised the device again after it had been unplugged and reconnected.

■ Online	http://www.logitech.com/au
■ Price	\$299
■ In short	Clever design, easy to use, but picture quality wasn't the best.

PCA645VC

PHILIPS

Of the three video cameras we reviewed, the Philips PCA645VC was the cheapest at only \$249, making it excellent value for money. The cute, rounded design gives it an almost cartoonish look. The camera has a quarter-inch tripod mount, and also comes with a small three-legged rubber stand. Its rounded underside sits on top of

this stand, which allows you to angle the camera in just about any direction. This means it may not hold its position through table bumps and so on, but a little Blu-

Tack would easily fix that.

The Philips camera had excellent picture quality in all respects. The picture was sharp and the colours were spot on, even in tricky mixed lighting and low light situations. Like its competitors, it can manage video up to 352 by 288 pixels. The sound quality was also good, but it picked up more background noise than the Logitech camera.

Installation was as easy as expected: just run the set-up program, then reboot, and it runs a quick diagnostic wizard. The wizard seems redundant, as it just checks if the video and audio work, but it helped APC's reviewers fix the problem we initially had with the audio settings.

This camera comes with Windows drivers and Videogram Creator, which allows you to make executable video messages that you can send as email attachments.

Josh Mehlman

■ Distributor	Philips PC Peripherals
■ Phone	1800 658 086
■ Online	http://www.philips.com.au/pcperipherals/
■ Price	\$249
■ In short	Funky-looking design and terrific picture quality.

INPUT DEVICES

WingMan Formula Force USB

LOGITECH

Racing games have hyped their 'excitement' and 'exhilaration', but never really delivered. Until now, that is. Logitech's WingMan Formula Force is a steering wheel and pedal combination that puts realism into racing games, and 'coronary' back into your vocabulary.

The day we plugged it in was the day that APC ground to a halt. [Ed note: This product will soon be returned to Logitech in order to allow the reviews team to better concentrate on their 'work'.] It gives better response and control over other force feedback products due to the cable technology used. When driving over various surfaces you can feel the difference in the wheel. It makes your reaction time much faster, and intensifies the overall racing experience.

The Formula Force comes with Windows drivers only and Windows picked it up immediately when we installed the drivers and calibration and testing software. The only hassle was that we had to



specify it as a game controller in the control panel.

The steering wheel has two built-in G-clamps to fix it to the desktop, and we recommend screwing it on tightly. The pedals are great, but they are a little too close together, and are raised high off the floor, making it uncomfortable for taller people. We got around this by pushing them way back under the desk, but not everyone would have the room.

It's unlikely to entice anyone other than true racing aficionados due to its price, but if you can afford it, WingMan Formula Force is well worth it. Unfortunately, now that I have used it, I can no longer go back to racing with a keyboard or joystick.

Darren Ellis

■ Distributor	Logitech
■ Phone	(02) 9972 3711

■ Online	http://www.logitech.com/au/
■ Price	\$369
■ In short	Fantastic toy, but expensive.

Logitech USB Wheel Mouse

LOGITECH

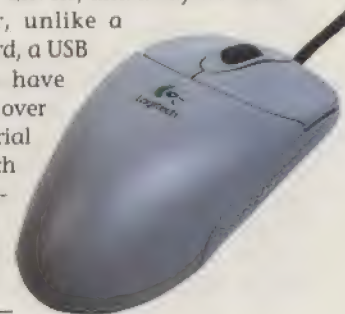
This is another product, like the Microsoft Natural keyboard, that did not require any special drivers to get going — a perfect example of USB plug and play at its best. We plugged it in, Windows and Mac OS installed the drivers, and away we went.

However, unlike a USB keyboard, a USB mouse does have advantages over a PS/2 or serial mouse, which have unreasonably slow maximum movement rates — but you would never notice this until you tried a USB mouse. A USB mouse gives smoother movement and greater freedom, and makes a PS/2/serial mouse seem clunky. A good test is to have both plugged in simultaneously.

This mouse from Logitech features a wheel to scroll through Web pages and text.

Darren Ellis

■ Distributor	Logitech
■ Phone	(02) 9972 3711
■ Online	http://www.logitech.com/au/
■ Price	\$89.95
■ In short	Smoother and faster than other mice.



Microsoft Natural Keyboard Elite

MICROSOFT

You tend to either love Microsoft products or hate them, and the Natural Keyboard line is no exception. The USB version of the product offers nothing new



or different over the PS/2 version, aside from the USB connection (it has a PS/2 connection, but comes with a USB adapter dongle). It is extremely comfortable to use, as the key layout is split into two sections that conform to the natural angle of the typist's hands.

The Natural Keyboard is highly recommended for touch typists or speed typists, but two-finger typists, hunt-and-peckers and people who need to look at the keyboard may not find it entirely suitable. With a bit of practice, though, the Natural Keyboard can become a pleasure to use.

Another keyboard layout difference is the arrangement of the arrow keys — they take the shape of a cross. This makes sense, but is hard to get used to. As for setup, we plugged it in and were using it within seconds. It can even work with an existing PS/2 keyboard plugged in.

Darren Ellis

■ Distributor	Microsoft
■ Phone	132 058
■ Online	http://www.microsoft.com/
■ Price	\$99
■ In short	Comfortable to use, but there is no discernable USB advantage.

SideWinder Freestyle Pro

MICROSOFT

Aside from its Batman styling, Microsoft's SideWinder Freestyle Pro looks like a fairly ordinary, if rather advanced, gamepad controller. It has a hat controller, throttle control and six buttons.



Inside, however, is a motion sensor that detects pitch and roll movements of the gamepad, which means you just tilt the controller in the direction you want to go, and it goes. This is not as simple as it sounds. The SideWinder's control panel doesn't allow you to centre it, you have to hold the gamepad the way the gamepad thinks it is centred. It also doesn't allow you to adjust its sensitivity to motion, and we found it was a little too sensitive: you have to hold it quite steady in order to stay still and not go anywhere. Of course, you

could turn off the motion sensor and use the Freestyle Pro as a normal gamepad.

Thanks to USB, the SideWinder Freestyle Pro is really easy to install under Windows 98, and once you get used to its quirks, it's a really good way to play flight simulators and driving games.

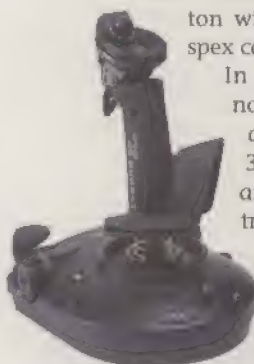
Josh Mehlman

■ Distributor	Microsoft
■ Phone	132 058
■ Online	http://www.microsoft.com/
■ Price	\$129
■ In short	A really interesting idea. Great if you can get used to it.

Cyborg 3D Stick

SAITEK

With its industrial-looking exposed screws, metal parts and nasty-looking trigger assembly, the Cyborg 3D looks like something out of 'Terminator'. The only thing that's missing is a 'kill' button with a flip-up perspex cover.



In addition to the normal two joystick axes, the Cyborg 3D has a twist axis and a throttle control. There's a trigger fire button, then there are three more buttons and a POV hat you can reach with your thumb, and another six buttons on the base of the joystick. This makes it great for flight simulators and first-person shootouts.

The joystick's designers have put a lot of thought into ergonomics. The grip is very comfortable, thanks to the contoured hand rest which can be adjusted for different hand sizes. The hand rest and the throttle control can also be adjusted for left or right-handers.

The Cyborg 3D Stick takes full advantage of USB and doesn't need drivers at all. You just plug it in and your PC or Mac works out what it is and how to cope with it (to do this under Mac OS you need to have InputSprockets 1.4 or higher installed). This seems like a great idea, but it does have one disadvantage: you can't use joystick configuration files for games, so you have to configure some games on your own. That small problem aside, this is one great 'plug and play' about two weeks nonstop' joystick.

Josh Mehlman

■ Distributor	Innovision
■ Phone	(03) 9853 6824
■ Online	http://www.saitek.com/
■ Price	\$149
■ In short	We didn't want to give it back.

MODEMS

NetComm Roadster II 56K USB modem

NETCOMM

The NetComm Roadster II is reasonably priced and good quality. It was easy to set up; it just needed to be plugged in and have the drivers for Windows or Mac OS installed from floppy. The Roadster II was one of the few devices we tested that drew its power from the USB port.

The box boasts that because the Roadster is a USB modem, it will work faster than a serial modem. This may be true, but it is somewhat misleading as it implies that the modem will surf faster. The speed difference in connections would not be discernible with a 56K modem, as only an ISDN or cable modem can exceed a serial port's maximum throughput.



The Roadster II fully supports the V.90 standard and is also backward compatible with the K56Flex standard. Better still is the support for Simultaneous Voice and Data (SVD) transfer — you can talk to someone while you are sending data to them, over a single phone line. To help you do this, the modem comes with a headset.

It is also bundled with a lot of software, including the WinFax Pro 8 voice/messaging suite. This lets you use the modem and PC as an answering machine and messaging service, with remote messaging and forwarding capabilities. The NetComm Roadster II 56K modem comes with a one-year warranty, plus two more years upon registration.

Darren Ellis

■ Distributor	NetComm
■ Phone	(02) 9424 2070
■ Online	http://www.netcomm.com.au/
■ Price	\$299
■ In short	Compact modem with no set-up hassles.

● PRINTERS

Epson Stylus Color 740

EPSON

This is the only USB printer we managed to get in for this review. The Epson Stylus Color is a fine printer, as we've come to expect from the Stylus Color range. Its output was excellent (its maximum resolution is 1,440 by 720 dpi), and also quite fast. The 740 supports a variety of media, and has paper feed capabilities typical of consumer-level inkjet printers, holding up to 100 sheets of plain paper.

We had trouble getting the Epson Stylus Color 740 to work properly using USB. On the three machines we tried it (a Dell Dimension desktop, an IBM ThinkPad notebook and an iMac), we could only manage to get it to work on the notebook, and only by using an arcane system of



unplugging then re-plugging the device from the USB port. (We had to do this every time the computer was rebooted.) Even the latest drivers downloaded from the Web could not fix this. The printer is still supplied with a parallel port, as it seems Epson thinks that only Mac users will want to use the USB connectivity option.

Overall, if you're looking for an exclusive USB printer, you should probably give this one a miss, or at least test it before you buy. As a parallel port printer, the Epson is really great, but technical problems plague its USB implementation.

Nathan Taylor

■ Distributor	Epson
■ Phone	(02) 9903 9000
■ Online	http://www.epson.com.au/
■ Price	\$599
■ In short	A fine printer, but its USB implementation has technical problems.

● SCANNERS

SnapScan 1212u

AGFA

The SnapScan 1212u is priced to compete with entry-level home scanners at \$299, yet it has features that would appeal to professionals. It's an unremarkable-looking A4 flatbed scanner, but it manages up to 1,200 by 600dpi optical resolution and 36-bit colour depth.

The SnapScan makes good use of USB's 12Mbps bandwidth to improve its scanning speed, breezing through even high-resolution scans before you have a chance to get bored. It scanned a standard-size photo at 600dpi in under half a minute. The sharpness and subtlety of tone and colour in scanned images were very impressive, assisted by the SnapScan recalibrating itself for every scan, although this added several seconds to scanning time.

The SnapScan 1212u comes with two TWAIN drivers for scanning images. Foto-Snap gives you few options but makes it



easy to scan images quickly, while FotoLook offers a wide range of sophisticated controls. Although Foto-

Snap's range of options is limited, it does allow you to adjust the settings depending on whether you're scanning from a photo, magazine or newspaper, and reduces the moiré patterns you usually get scanning from magazine pictures.

Installing the drivers was simple on both Mac and PC, and the scanner comes bundled with a comprehensive range of software suitable for home users.

Josh Mehlman

■ Distributor	Agfa
■ Phone	(02) 9391 6611
■ Online	http://www.aglahome.com/
■ Price	\$299
■ In short	A speedy, high-quality scanner at a bargain price.

● SPEAKERS

Altec Lansing ADA305 Digital PowerCube Speaker System

INNOVISION

At APC we are no strangers to the quality of Altec Lansing's speakers (the ACS495 sets

are shipped with Dell Dimension systems) so we knew what to expect — thumping bass, crystal sound and remarkable audio. The ADA305s didn't disappoint us at all.

Windows found the speakers when they were plugged in, but required the Windows 98 installation disk for its drivers. A separate CD contains some control software for the speakers, which is used to finetune and calibrate the settings. No drivers are included for Mac OS. Unlike the Philips DSS370 and the ADA70s reviewed



here, the subwoofer volume control is conveniently placed on the satellite speaker with the general volume and surround sound volume controls. This is a lot easier than having to duck below the desk to fiddle with the subwoofer settings.

The satellites each feature two three-inch drivers which are angled to maximise the sound output through the room, and the subwoofer has a six-inch dual voice coil. These speakers equal, and sometimes better, a home hi-fi set, although they are expensive.

Darren Ellis

■ Distributor	Innovision
■ Phone	(03) 9853 3824
■ Online	http://www.innovision.com.au/
■ Price	\$389
■ In short	Great sound but possibly a bit pricey.

Altec Lansing ADA70 Digital PowerCube Speaker System

INNOVISION

A difference with the Altec Lansing Digital PowerCube speaker systems and other brands is that the audio signal is streamed directly from the USB connection to the speaker. The actual digital audio signal is converted to analog within the speaker. This not only frees up system resources, but gives a crisper sound by avoiding interference from other sources such as the CPU fan or disk drives. This is a good feature, but does not always work well if you have a soundcard installed, although you can use the speakers as you would a normal pair.

These speakers are similar to the ADA305s, but the biggest difference is that

the satellites have only one driver, not two. This is noticeable when using software 3D or surround effects, but overall the audio quality is high. The subwoofer volume control is not conveniently placed; Altec Lansing has not only put it on the subwoofer itself, but hidden the tiny dial right at the back near the bottom.

The sound quality is not as good as the ADA305 speakers, but they are cheaper and sound a lot better than most satellite/subwoofer speaker combinations for the PC.

Darren Ellis



- **Distributor** Innovision
- **Phone** (03) 9853 3824
- **Online** <http://www.innovision.com.au/>
- **Price** \$299
- **In short** A good buy for the home, too powerful for the office.

Philips DSS370 speakers

PHILIPS

Philips' earlier attempt at USB digital speakers (DSS350) was blasé at best, but it seems to have picked up its act with the DSS370 with subwoofer. Although in terms of volume and clarity they still do not fare as well as the Altec Lansing speakers reviewed here, they performed quite well in their own right. It is also pleasing when the USB works correctly, and these speakers gave us no trouble at all under Windows 98.

For two speaker surround effects, these speakers hit the mark. Philips' Incredible Surround feature is remarkably good, giving a rich depth of sound not often found in multimedia PC speakers, and it couldn't be matched by the Altec Lansing speakers. The subwoofer didn't quite complement the satellite speakers and could occasionally be heard as a separate entity.

As with the Altec Lansing speakers, the DSS370s have separate controls for the satellite and subwoofer volumes. Unfortunately, Philips has also placed the subwoofer control on the subwoofer itself, unlike the handy satellite placement on the Altec Lansing ADA305 set. Another drawback is that the pair of satellites and subwoofer need separate



power supplies. Powering the lot from one connection would have seen them rating better in our eyes.

The package comes bundled with Phoenix Technologies PlugWorks, which is a USB configuration and troubleshooting utility that could prove indispensable for the USB novice.

Darren Ellis

- **Distributor** Philips PC Peripherals
- **Phone** 1800 658 086
- **Online** <http://www.philips.com.au/pcperipherals/>
- **Price** \$299
- **In short** Good sound, great effects.

STORAGE DEVICES

SuperDisk Drive

IMATION

With its distinctive colouring, it's not too hard to guess that Imation's LS-120 drive is intended as a companion for the floppy-drive-deficient iMac. Installing the SuperDisk is hard to mess up, as noted in APC's review (see APC December 1998, page 44), unless you forget to plug it into the wall. You might not think it's working, since there's no indication anything has changed until you put a disk into the drive. But once the disk is in, the system mounts the disk and it shows up on the desktop.

Although it was rather slow at transferring data to conventional floppy disks, transferring files to a SuperDisk was quite fast. You also get an extra 20M of disk space compared to a Zip disk, and have the added advantage of being able to use regular floppy disks.

However, we can't help but wonder if Imation hasn't made a blunder in segmenting this product out of the PC market. Imation already makes LS-120 drives for PCs using IDE and parallel port inter-



faces. It would require nothing more than writing a driver for PCs to also make the USB drive available to the non-Mac crowd, but Imation has declined to do so, no doubt to avoid cannibalising its own markets.

Josh Mehlman

- **Distributor** Imation
- **Phone** 1800 225 013
- **Online** <http://www.superdisk.com/>
- **Price** \$379
- **In short** Removable storage for the iMac for those who miss floppies.

USB Zip 100

IOMEGA

Imation has made a decisive step in the battle for removable storage in introducing the USB Zip 100 drive. The USB Zip plugs into Windows and Mac systems with ease.

There's almost no technical difference between a parallel port or SCSI Zip drive and the new USB drive, save the blue transparent plastic casing, but the USB plug at the end makes an amazing difference. Previously, you always had to reboot after attaching the drive before your system would recognise it. But once the drivers for the USB Zip drive are installed, you just plug it in and the system recognises it after a few seconds.

The other major difference the USB interface makes is the speed. For those used to the slothful parallel port Zip drive, the USB drive will be a revelation. Those familiar with IDE or SCSI Zip drives



may be less impressed, if they overlook the fact that IDE can only be internal, and not that many Wintel systems are equipped with a SCSI interface. The USB interface makes the Zip drive much more portable and easy to connect than ever. The USB Zip drive should particularly appeal to the market Imation has ignored completely with its LS-120 drives — people who need to transfer large files between Macs and PCs.

Josh Mehlman

- **Distributor** iomega
- **Phone** (02) 9925 7700
- **Online** <http://www.iomega.com/>
- **Price** \$349
- **In short** Fast and convenient portable storage for Macs and PCs.

Desktop publishing has reached the point where even 'consumer' products can deliver professional looking results. **By Stephen Withers**

The lowdown on layout

Desktop publishing (DTP) was born in 1985 when Aldus — now Adobe — PageMaker took advantage of the still-new GUI provided by the Macintosh, plus the even newer PostScript-driven Apple LaserWriter printer. In the late 1980s it was, for a time, even used by secretarial staff for relatively simple documents, until the increasing power of word processors put an end to that.

It could be argued that DTP is now about producing material that's going to be printed, but that definition is both too broad and too narrow. Too broad, because even accounting programs generate printed results; too narrow, because documents are increasingly being delivered electronically.

Whatever your definition, DTP software falls into two distinct groups. On one side there are the 'serious' tools: Adobe PageMaker, Corel Ventura Publisher and QuarkXPress. Used predominantly by DTP professionals, these applications can import a wide variety of source material, provide a flexible user interface that allows speedy operation, and offer a high level of control over the results, for example in terms of typography and the precise positioning of elements.

Another important consideration is that documents created with these packages are acceptable to typesetting and other print-related service bureaus, so you'll be OK when designing product packaging, a book, or a brochure that you're going to individualise for clients on a digital press.

Our comments on tools in this group — which for the purpose of these reviews we've allotted the 'professional' classification — follow discussions with professional designers, but the reviews were conducted from the perspective of a seasoned computer user who needed to create printed materials, rather than that of a design professional. We replicated an APC layout with each of the three professional programs. We wanted to see how easy it was



to create each feature, precisely position various elements, import text and graphics, and apply the appropriate styling.

Consumer packages

The other group consists of consumer and 'prosumer' packages, largely from well-known companies such as Corel, IMSI and Microsoft. We've put these packages into the 'consumer' category for the purposes of this feature. Template driven, these programs allow almost anyone to turn out a respectable-looking document, whether it is a greeting card, newsletter, brochure or set of business stationery (letterhead, business card, invoice forms and so on).

The problem with relying on templates is that your documents will probably look like someone else's. You can start from scratch or make extensive modifications to a supplied design, but unless you know what you are doing, it's remarkably easy to end up with a newsletter that looks like a dog's dinner.

What's really needed is an intelligent assistant in these programs, something

that will advise against particular combinations of fonts or colours, flags too-small type in documents intended for the very young or the elderly, suggests you do not use all capitals for text set in a script font, and so on. Since such features are absent, our reviews of products in this category focus on ease of use and the quality and usefulness of templates and other content in an Australian context. If there is one way in which this category of programs falls short of our requirements, it is in their US-centric content.

Although most of the packages include HTML output and several provide some kind of graphical email feature, we concentrated on printed output.

All programs were tested under Windows 95, though the boxes of Brøderbund Print Shop Deluxe, IMSI MasterClips Publisher, Microsoft Home Publishing 99 and Mindscape PrintMaster Platinum indicate they are Windows 98 compatible. Expert Personal Publisher also includes a Windows 3.1 version. Macintosh versions of Adobe PageMaker and QuarkXPress are available.

● PROFESSIONAL

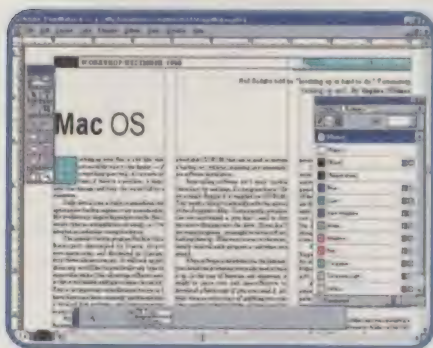
PageMaker 6.5

ADOBE

While we wait for the release of the next version of PageMaker — reputedly a Quark-killer — we've had a look at the existing version.

We found it quite easy to duplicate a page from APC using PageMaker, and in many ways found it to be on a par with QuarkXPress for overall ease of use. For example, horizontal and vertical rules are easily drawn and then adjusted to a precise position using the Control palette. However, it lacks QuarkXPress' ability to combine geometric objects. Furthermore, additional nodes can be added to polygons, but the segments remain straight lines, not curves, so the only way we could reproduce the rectangles with one rounded corner that are a feature of APC's page headers was by overlaying a rounded rectangle with page-coloured rectangles to hide the three unwanted rounded corners.

The user interface has floating palettes (notably the Control palette) and sensibly



arranged menus which worked well in most cases. The use of tabbed palettes is a convenient way of saving screen space. The Undo command was unavailable more often than we would have liked.

The Autoflow feature simplifies the placement of long passages of text, flowing automatically through columns and adding pages as needed. We have mixed feelings about the Story Editor. While it is sometimes convenient to work on the text without the clutter of formatting, we would prefer the Find, Change and Spelling commands to also be available in the normal Layout view of the document. That said, the Change command does allow character and paragraph attributes to be altered for the target text.

The idea of having separate layers in a document is an interesting one, and it

works very well. For example, you can place all the graphic elements on one layer, and different versions of the text (for example text in different languages) on others. Each layer can then be turned on or off with a simple mouseclick.

PageMaker often failed to redraw the screen properly — this was especially noticeable when working on drop caps. We also saw objects that appeared to touch when displayed at higher magnifications, yet were separated by a one-pixel-wide line at actual size.

The ability to apply Photoshop effects to TIFF images within PageMaker is convenient. Adobe Gallery Effects are included, but other Photoshop-compatible plug-ins can be used. Adobe even made provision for PageMaker to use a shortcut to the folder containing plug-ins installed for your graphics program, thus avoiding duplication and wasted disk space.

The program can generate HTML, but the results with APC's three-column layout were not attractive (far too much space was left for the graphic, text margins were not straight, and PageMaker graphic objects were not translated). Still, there's always PDF as a fallback.

The *Getting Started* leaflet is useful, but we didn't find the on-disc tutorials helpful (animation alone just wasn't sufficient to convey the message). The main manual is well written and indexed, and there's also a quick reference card and a Print Publishing Guide.

Photoshop LE 4.0 and ATM 4.0 are included in the package, plus a selection of trial versions of other Adobe software.

■ Distributor	Adobe
■ Phone	1800 065 628
■ Online	http://www.adobe.com/
■ Price	\$1,295
■ In short	Most users are accustomed to less expensive software, but there's value here for 'semi-pro' designers as well as DTP specialists.

Ventura Publisher 8

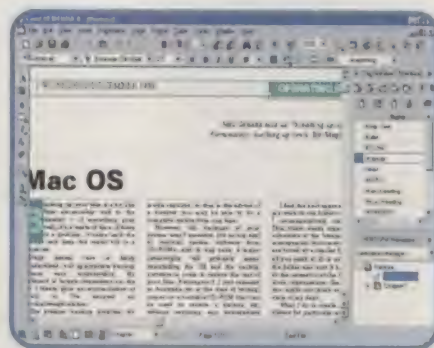
COREL

Ventura turned out to be the least comfortable of the three high-end packages we tested. Contributing factors included the use of a paned window instead of floating palettes (they can be undocked, but are bulky and lack the ability to roll up to just a title bar), some questionable decisions about the location of certain commands (such as putting Convert to Curves under Format, Arrange), and the occasional difficulty of selecting one of

several adjacent objects (compared with QuarkXPress and PageMaker).

We experienced considerable difficulty removing additional space between paragraphs in text that had been copied and pasted from another application. The only way we managed to close up the space was to export the text to an RTF file, open it in Word, adjust the paragraph formatting and re-import it in Ventura.

We were able to create a reasonable copy of the APC layout. Ventura allows objects such as rectangular frames to be



converted to curves, which can then be edited by adding, deleting and adjusting the nodes. However, that task isn't easy if you want to replace a 90° angle with a smooth curve. Instead, we found it easier to combine a circle with a rectangle, then remove the unwanted line segments and convert the result into a frame — a process that was more involved than the equivalent in QuarkXPress. Fortunately, shapes can be created in a graphics program, imported and converted to frames. Another problem we encountered when adjusting frame shapes was the need to force a screen redraw after each operation to see its result.

On the other hand, Ventura does provide many of the features found in its more expensive competitors, including positioning by measurement and changing attributes during a Find & Replace operation.

Other features include a Copy Editor view (equivalent to PageMaker's Story Editor), Pantone and other proprietary colour palettes, a variety of gradient and other fill patterns, and spelling and grammar checking. In some circumstances, the Export on Save feature can be very useful, as it automatically creates a fresh copy of an imported text file that includes any changes made to the text in Ventura.

A noteworthy touch is that the Font menu displays a text sample in the current selection; this is a boon if you don't know every font by name.

Its relatively low price will be attractive to some buyers, especially as it includes an

extensive package of extras. Ventura comes with Photo-Paint (a Photoshop-style graphics program) and various effects filters, WordPerfect 8, DataBase Publisher (to create electronic or paper documents from the contents of databases), plus scanning (a photographically printed scanner target is included to assist calibration), OCR, outlining and version-management utilities, and more.

The content libraries provide about 1,000 photos, 40,000 pieces of clip art, 1,000 fonts, and 80 Ventura templates. They will probably be of more interest to the semi-professional user, but they provide considerable variety. The clip art even includes street maps of major Australian cities.

The software is reasonably well documented, and the main Ventura manual includes information about scripting. The double-sided Ventura/Photo-Paint quick reference card features a useful cut-out function key template. The Libraries catalogue is in colour, and includes some guidance on the appropriate use of different fonts. Corel's Commercial Printing Guide is perhaps a little more accessible to a layperson than the equivalent document from Quark, but that's not surprising given its likely audience.

■ Distributor	Corel
■ Phone	1800 658 850
■ Online	http://www.corel.com/international/australia/
■ Price	\$899
■ In short	Excellent value for general users, but still lacks some of the polish of its more expensive competitors.

QuarkXPress Passport 4.04

QUARK

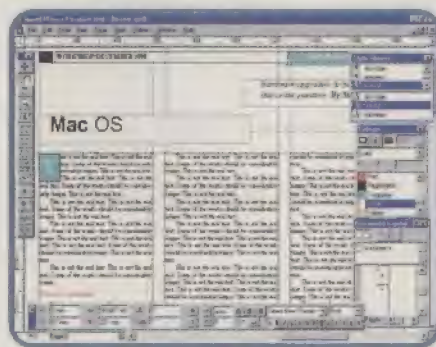
Unlike all the other programs tested here, QuarkXPress uses a parallel-port pass-through dongle to enforce copy protection. Given the increasing use and complexity of parallel port devices such as CD-R drives, we are increasingly uncomfortable with dongles, and note that this one interfered with the operation of the Hewlett-Packard OfficeJet 710 multifunction device connected to one of our test PCs.

There were several minor hiccups in the installation routine (which involved two CD-ROMs and two floppies), and this would not be a good first impression if you've just paid nearly \$2,500 for some software.

But once you're up and running, QuarkXPress is very powerful. We were particularly impressed by the function that lets you merge two or more boxes. This makes it easy to construct text or pic-

ture boxes of non-standard geometrical shapes, such as the rectangles with one curved corner used in APC's page headers. This is far simpler than messing with control points in an attempt to reshape a box. (Although QuarkXPress is used to produce APC, our design predates this feature.) Complex shapes can be constructed in this way, and along with the new text path feature and the ability to convert a piece of text into a picture or text box (though text flowed through such a box tends to look odd), it reduces the need for an illustration program.

We also appreciated QuarkXPress' ability to handle arithmetic expressions in the Measurements palette, as this makes it



easier to position objects relative to each other prior to a merge operation or simply to achieve a desired arrangement. Another convenient feature is the addition of character style sheets to the existing paragraph-based styles. Imagine a document where a product name must always appear in a particular font and colour, and all in capitals. Once an appropriate character style has been created for that combination, it can be applied in one hit, instead of three separate steps. Better yet, QuarkXPress lets you apply a style sheet (and other attributes) as part of a Find/Change operation, so such a change is only a moment's work, even in a long document.

The user interface is clean, avoiding the Office-style toolbar look that consumes screen real estate with buttons for functions with easily memorised keyboard shortcuts. Almost every command has a shortcut, and although some key combinations seem arcane at first, there is some underlying logic, and it is worth learning those applicable to your daily work. We found the commands were placed under appropriate menus, reducing the need to refer to the online help or manual.

QuarkXPress includes palettes for Pantone, Hexachrome and other colour mod-



EDITOR'S CHOICE

PROFESSIONAL

● **Adobe PageMaker 6.5**

CONSUMER

● **Sierra Print Artist Platinum**

HIGHLY COMMENDED

● **IMSI MasterClips Publisher**

PageMaker provides the best balance of power, usability and affordability in the Professional category. The relatively high price of QuarkXPress means that our hypothetical 'serious, but not a design professional' user would find it harder to get value from the program despite its strengths, and its dongle can cause problems with peripherals. Some people will be attracted to Ventura's lower price and extensive content library, but we feel the user interface needs more work.

There's a wide choice for general home and SOHO use (consumer), but we can't wholeheartedly recommend any of them due to the fact that you can't customise a set of related documents in one hit, and in some cases the difficulty of making what would seem to be fairly simple changes.

We found Sierra Print Artist Platinum easy to use and believe it provides the best selection of templates and graphics, though we wish its catalogue was printed in colour. It also includes a superior photo-manipulation program.

MasterClips Publisher is highly commended for its relatively advanced features for producing documents such as newsletters.

els, but you can create your own colours based on RGB, CMYK or other models. The Colours palette itself only contains the colours selected for the document, which makes it easy to use a consistent set of colours in a design.

Collect for Output copies the active document plus all of the graphics it uses into a specified file, generating a report containing information relevant to someone (such as a service bureau) who must use the document. It would be useful if it also provided the option of collecting the fonts used.

QuarkXPress provides a good, extensive and generally clear manual that only let us down a couple of times, plus a tutorial

booklet, a quick reference to keyboard shortcuts, and a colour and prepress guide.

Of the three 'pro' packages tested, we found QuarkXPress the easiest and least stressful to use, though that convenience comes at a high price.

■ Distributor	Elite Software
■ Phone	(02) 9975 5855
■ Online	http://www.elitesoftware.com.au/
■ Price	\$2,495
■ In short	It's easy to see why many professional designers swear by QuarkXPress, but beware of 'sticker shock' and the dongle.

● CONSUMER

Print Shop Deluxe 6.0

BRØDERBUND

Print Shop's 6,600 templates — which cover a wide range of document types — are OK, but the majority looked like they were done in a low-end DTP program, compared to the professional-looking designs found in some other packages.

Some templates let you work on matching items together (for example, letterheads and envelopes), but changing an address on one doesn't alter it in the others in the set. The mail-merge feature works nicely, but there's no apparent way of loading address lists from other applications.



Text-heavy documents (newsletters, booklets, and so on) are created in Print Shop Press Writer. A4 support was generally lacking, but this was to be rectified just after our testing period. Text styles can be defined, and entire style sets changed in one go to alter the overall appearance. As with up-market programs, it's possible to flow text between boxes.

Spell check, thesaurus, hyphenation and word count are provided, along with 'artistic' text effects for headlines.

There are over 100,000 pieces of US-

centric clip art and photos. For example, the 'indigenous peoples' are drawn almost entirely from the Americas and almost all the facts in 'On This Day' are American.

A strong feature is the Photo Workshop, which lets you easily add effects such as torn edges or canvas. It can also be used to remove dust and scratch marks, and for freehand and geometric cropping. There's also Photo Organizer which helps you manage your collection. The package has real manuals, including a graphics catalogue printed in colour.

■ Distributor	Dataflow
■ Phone	(02) 9417 9700
■ Online	http://www.dataflow.com.au/
■ Price	\$79.95
■ In short	Nice software, but generally uninspiring templates.

Print House Magic Deluxe

COREL

Aimed at the home market, Print House Magic makes it easy to produce a variety of printed materials such as greeting cards, kid's party stationery and calendars. Templates are also provided for business-related projects such as the creation of brochures and invoices, but that market is better served by Print Office (see review below).

Print House is wizard driven and therefore easy to use, although you could always use it in the traditional manner. Our main concern was that while there are families of templates to create a set of documents (so the party invitations match the placemats), you can't make global changes to the look; you must work on each document individually.

The package also includes Family and Friends (a PIM that can help remind you to create a birthday card before you need to send belated greetings and can act as a data source for mail-merge operations) and Photo House (an image editor that includes a variety of special effects).

A collection of 60,000 photos and more



than 40,000 other graphics means there's a good chance of finding an appropriate image for your project. There is also a useful mix of over 150 fonts which provide a useful range of styles. A sample pack of speciality inkjet papers from Hewlett-Packard is a useful bonus.

The bulk of the manual is taken up by a catalogue of the clip media, which is useful. Unfortunately, the catalogue doesn't include the photos on the fourth CD-ROM.

■ Distributor	Corel
■ Phone	1800 658 850
■ Online	http://www.corel.com/international/australia/
■ Price	\$129
■ In short	Easy to use and includes good templates, but relatively expensive.

Print Office

COREL

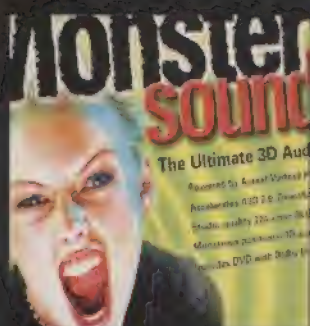
There's a distinct family resemblance between Corel's Print Office and Print House, but as its name suggests, Print Office focuses on the production of business-related materials such as business cards, brochures and newsletters.

Once again, a wizard-style interface makes it fairly easy for a beginner to customise a document using one of the many templates. However, the use of a notebook metaphor means the wizard takes up a lot of screen real estate. It's bearable at 800 by



600 pixels, but if you're working on anything bigger than a business card, you'll need to zoom out or spend a lot of time with the scroll bars.

Templates are provided for a variety of business documents. Some are 'theme sets' of matching stationery (letterhead, business cards, invoices, and so on), and a subset of these are 'Quickway' projects that prompt you for details such as name and address. This information is retained, so you can create another document from the same family even faster. Unfortunately, alterations



**Faster,
Faster,
Faster,
Faster,
Faster.**



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such as adjustments to close up an unused field or a colour change are not carried over to subsequent documents in the family.

Changes to documents can be made using the wizards or directly using the menus and toolbars. If you wish, you can create a document from scratch.

Being a Corel product, it comes with 'steak knives' — the Photo House image editor (double-clicking a bitmap in a Print Office document opens the image in Photo House), Colleagues & Contacts (a personal organiser bearing a distinct resemblance to Family & Friends), a sample pack of Hewlett-Packard speciality inkjet papers, over 150 fonts, 25,000-plus pieces of clip art and 10,000 photos. Keyword searches for images only cover the CD currently in the drive, which is irritating, and you need to search for photos and clip art separately.

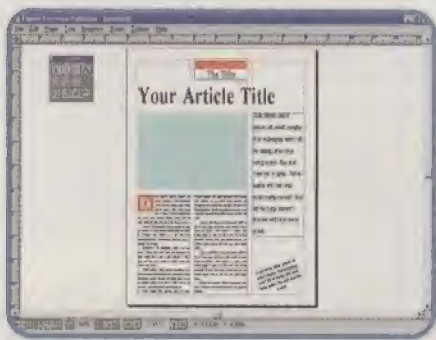
■ Distributor	Corel
■ Phone	1800 658 850
■ Online	http://www.corel.com/international/australia/
■ Price	\$139.95
■ In short	A useful collection of readily customised business documents.

Personal Publisher

EXPERT SOFTWARE

You might have seen this remarkably low-cost package on a shelf at your local post office. It has a reasonable feature set, but virtually no documentation or templates. If you're prepared to do the work yourself, and maybe buy some extra clip art, it's not a bad choice.

It can be a bit tricky to use; for example, individual paragraphs are treated separately, so you can accidentally move a paragraph instead of the frame that contains it. Fortunately, the Reflow Story com-



mand ties up any gaps between paragraphs. Also, there is no undoing some operations such as changing column widths.

On the other hand, it's easy to select one

of several overlapping objects — click once, you get the top-most, a second click changes the selection to the second one, and so on.

The program allows multiple columns on a page or within a frame, and supports text flow between frames. Text styles can be updated from the current paragraph's settings or by using a dialog box.

The Microsoft Word filter doesn't work, as noted in the Read Me file, and Personal Publisher can't import JPEG files (you might be able to convert a picture to TIFF or PCX with an appropriate third-party utility). The option to output CYMK process separations was always disabled when we tried it, and the program didn't allow the specification of CYMK colours.

There's no printed documentation, but what do you expect for \$20? However, an electronic manual would be better than the online help to learn about the program. If you're prepared to experiment, there is value here; those less confident would be better served by one of the other packages.

■ Distributor	Dataflow
■ Phone	(02) 9417 9700
■ Online	http://www.dataflow.com.au/
■ Price	\$19.95
■ In short	Good value for DIYers, but virtually no ready-made content.

MasterClips Publisher

IMSI

This is a good choice for relatively serious DTP without the high price tag. It includes features such as text styles (one style can be based on another so any changes to the base style flow through its derivatives), background spell checking, and spot and CYMK colour separations.

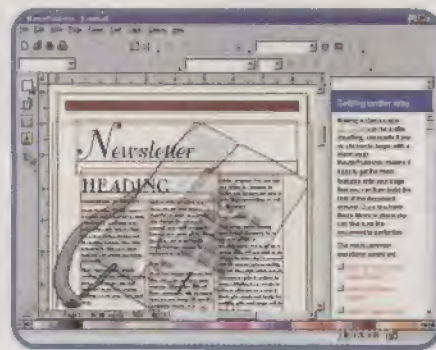
The home documents include cassette and CD covers, as well as the usual stationery items. The card designs are reasonably attractive.

There are some good examples of business stationery, but like the other packages, changes made to one document in a design set aren't automatically reflected in the others. Several designs use full-bleed backgrounds, which aren't supported by most printers.

Page Pilots (wizards) are provided to build common document types, while Power Text provides a good variety of 2D and 3D text effects.

MasterDraw is a decent drawing program that lets you build outlines comprised of a mix of straight lines, curves and Bézier curves. It can trace bitmaps, but our results weren't smooth enough to be useful.

PhotoEditor lets you make relatively basic changes to photos such as cropping and adjusting contrast or brightness, but omits popular features such as scratch and red-eye removal.



Unfortunately, the package's StartPage front end closes when you run one of the applications, so if you create a logo in MasterDraw you have to re-run StartPage in order to launch Master Publisher.

The package includes 54,000 pieces of editable clip art (useful when you need to change colours), 19,000 photos and 2,000 fonts.

There's a small *Getting Started* manual, but the main documentation is supplied as a 136-page Acrobat file.

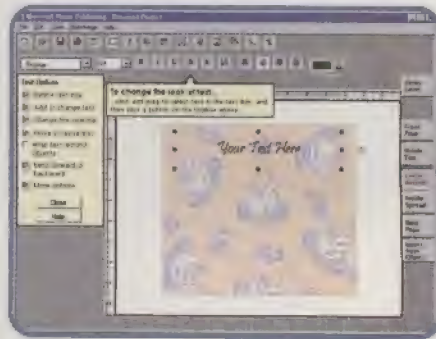
■ Distributor	Dataflow
■ Phone	(02) 9417 9700
■ Online	http://www.dataflow.com.au/
■ Price	\$79.95
■ In short	A good choice for creating documents from scratch.

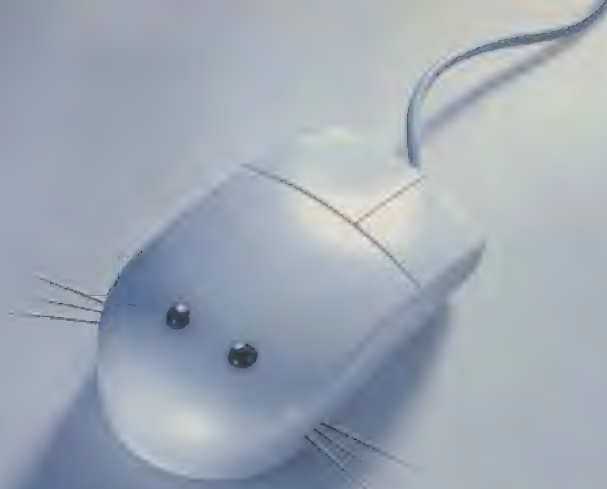
Home Publishing 99

MICROSOFT

Home Publishing has an inconsistent user interface — it is Web-like in some places, but not in others. Buttons familiar from other applications float on the background instead of being in a toolbar, which looks odd. It also uses checkboxes where other programs use radio buttons.

While you can change the text in tem-





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plates and add pictures, you generally can't make minor changes to backgrounds, as they are pictures and there are no editing facilities. For example, you can't change the colour of the envelopes in the party sets. Furthermore, some items (such as napkin rings) are repeated on a page, but if you change one, the others don't automatically change to match.

An interesting variety of shapes, including polygons, speech balloons, starbursts (with plain and gradient fills), are provided to add your own objects.

There is a lack of text flow between columns in two-column newsletter layouts, and several operations (including opening the gallery) are very slow compared to other products.

The package includes Picture It! Express 2.0, a very limited photo editor that basically handles colour adjustment and red-eye removal.

Eight thousand templates, over 76,000 pieces of clip media and 126 fonts are provided, but installing the clip art catalogue (not the files themselves) onto your hard disk requires about 160M of free space.

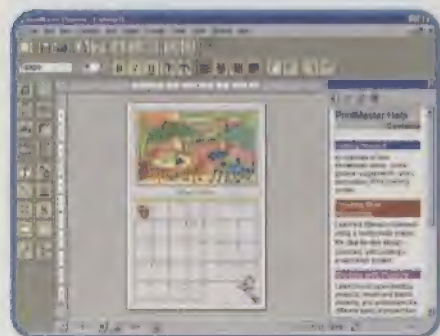
The only documentation is a 10-page README file.

■ Distributor	Microsoft
■ Phone	132 058
■ Online	http://www.microsoft.com/australia/
■ Price	\$89
■ In short	Unexciting templates, relatively difficult to customise, sluggish operation, inconsistent interface and no printed catalogue or manual.

PrintMaster Platinum 7.0

MINDSCAPE

PrintMaster handles the production of the usual types of stationery (and its greeting cards are among the best in the category), but it goes further by offering a variety of other activities such as 'fun photos' (add a face from a scanned snapshot to a silly



background) and craft projects including gift bags and boxes, paper planes and a model town. Some of the items we looked at were not accurately drawn. The calendar templates are attractive, but one that we tried consistently generated 2000 when asked for 1999.

PrintMaster's content seems particularly North American. For example, the 'Year You Were Born' feature includes the US college basketball champions. Images suitable for greeting cards are proportioned for 8.5 by 11in paper, not A4, though some 'readymade' cards automatically adjust for changes in paper size.

Four utility programs are included. PhotoEnhancer tweaks digitised images. BorderPlus creates borders for certificates and photos. DrawPlus is a fully featured drawing program. Cartoon-O-Matic lets you warp a selection of cartoon faces to suit your purpose.

The main program has a text warping tool, which can be used to create arched or perspective text, along with a variety of fill patterns and shadow effects.

The printed catalogue of clip art and photos (150,000 items) is in black and white. An online index to all the art (including the items you must pay extra to unlock) allows quick searching, though you can't limit the search to a particular kind of resource, such as photos. There are 260 fonts to complete the package.

■ Distributor	Scholastic New Media
■ Phone	(02) 4328 3555
■ Online	http://www.scholastic.com.au/
■ Price	\$129.95 (\$79.95 standard edition; \$99 deluxe edition)
■ In short	Would be a better buy if the content was more appropriate for Australia.

Print Artist Platinum

SIERRA

Print Artist's stationery templates feature a good selection of business cards, including part-time occupations, and social activities. They aren't all great, but the overall quality is above average. Once again we were disappointed that changes to a business card aren't automatically reflected in the corresponding letterhead.

The greeting card designs are pleasant and include cards for business purposes (for example, change of address notices). Some need 'de-Americanising',



but there are plenty of useful designs.

The craft category includes what appears to be the same model town set as PrintMaster (although it is more accurately drawn here), table decorations, gift-wrap projects and more.

Label templates (to suit various Avery labels) include seasonal return-address labels, video labels and much more. The certificates generally get away from the boring traditional style and the banners have bold designs for a variety of purposes.

The software is generally easy to use without going overboard with wizards and prompts. Stationery and cards can be created from scratch quickly and easily. Changes to text are made using a dialog box, and font and style changes affect the entire element, which makes it awkward to emphasise a single word.

Auxiliary software includes Ulead Photo Express, which lets you acquire, touch up and apply effects to photos and add them to a variety of projects including framed pictures, greetings cards and bogus magazine covers. It also includes Craft Factory SE for Kids, a version of the program described on our Web site. The package includes over 150,000 graphics, 29,000 photos and 300 fonts. The content is quite varied and not too US-centric.

Since we tested, Sierra's range has expanded with the \$149 Print Artist Publisher (the Platinum edition plus Quick-Publish and Snapshot Express software), Print Artist CardsPlus (a \$69.95 version specifically for greeting cards) and Complete Publisher 99 (\$199.95).

■ Distributor	Dataflow
■ Phone	(02) 9417 9700
■ Online	http://www.dataflow.com.au/
■ Price	\$99.95 (\$69.95 for the Gold edition which has less content and lacks Photo Express, Craft Factory SE and other software)
■ In short	Some of the best software in its class, plus good templates and other resources.

Workshop

131 APC Magazine

CONTENTS



Welcome to Workshop, the section dedicated to bringing you all manner of tips, interesting information and do-it-yourself tutorials. Within these pages you will also find useful shareware and informative operating system specific advice.

If you've been having trouble finding a copy of the *Linux Pocketbook*, fear not, for we have printed more copies of this red gold and it should be available at your favourite newsagency. You also can purchase a copy online at apcmag.com/shop.

Tech Talk 132

Technobabble examines network paraphernalia such as bridges, routers, hubs and switches, while Step by Step offers a guide on how to keep your printer in working order.

Get involved

All files mentioned in Workshop can be found on apcmag.cd or downloaded from our Web site at <http://apcmag.com/>. You can join one of our online discussion forums to discuss technical issues or just voice your opinion on any related topic.

Operating Systems 138

Windows 98 tidies up the Start menu and introduces the Quick Launch toolbar; OS/2 explains some of that operating system's multimedia advantages; Mac OS shows you how to write plug-ins for Sherlock; and Linux surveys some graphics tools.

Programming 148

We start a new series that will teach you some core programming in C++, and Java presents a method of creating client/server applications.

Shareware Summary 152

All the files mentioned here can be found in the Workshop section of this month's apcmag.cd.

Win! Win! Win!

Workshop is always on the lookout for the most interesting, strange, funny or downright weird software bugs you can find. These include code snippets, examples of features that function poorly, or procedures for crashing a particular application. Anything and everything that is buggy deserves mention.

Send us your favourite bug via email to bugs@apc.com.au or snail mail, and you'll be in the running to win your choice of **development or application software** from Workshop's prize cupboard. The prizes change each month to ensure there's always something interesting for avid bug-hunters. Please send screen captures, example code listings or detailed instructions for triggering a bug in an application, as appropriate for your entry.

The winner's name, along with details of the bug, will appear in the Bug of the Month column in the May edition of APC. So start hunting!



Bug of the Month

This month's bug comes from Harry Karipis, and a curious one it is. Harry sent me an HTML page with some very curious JavaScript.

A slightly reduced version of Harry's HTML looks a little like this:

while his JavaScript looks like this:

```
function calc1(form) {  
  var a,b,c;  
  a=form.tba.value;  
  b=form.tbb.value;  
  c=form.tbc.value;  
  form.answer1.value=a-b-c;  
}
```

```
function calc2 (form) {  
  var a,b,c;  
  a=form.tba.value;  
  b=form.tbb.value;  
  c=form.tbc.value;  
  form.answer2.value=a-(b+c);  
}
```

The problem is that a variable's type is defined by its first use. Each of the variables, a, b and c, are defined as text strings because their first use is to receive text from a text box.

Subtraction is not defined for text strings, so when the subtraction code is encountered, the JavaScript interpreter guesses (correctly) that you want a numeric subtraction and performs it correctly. However, the addition operator is defined to perform a concatenation for text strings. Thus (b+c) becomes 100 + 24 which is evaluated to 10024.

The solution is to use the `parseInt()` function to ensure that the first use of the variables is numeric, for example:

```
a=parseInt(form.tba.value);  
b=parseInt(form.tbb.value);  
c=parseInt(form.tbc.value);
```

To help ease his pain, Harry gets his choice from the vaults of the Workshop software archive.

Michael Smith

An introduction to the machinery of networks: bridges, routers and switches. **By Nathan Taylor**

Technobabble

Last month we covered the OSI model, a seven-layer schema designed to provide a reference for network engineers when developing open systems. This month, we're going to put that knowledge to good use.

We also alluded to the concept of packet switching. Before we go any further, I'll give you a brief overview of this. Broadly speaking, there are three ways you can deliver data across a multidevice network: circuit, packet and message switching. We are most familiar with *circuit switching*, because this is generally how phone systems are perceived to work — a persistent connection is set up between two devices and all messages are routed between the devices, excluding the rest of the network, until the connection is terminated.

A *packet-switched* network delivers data in chunks called *packets* (most data networks operate in this way). These chunks of data are encoded with a header that tells the network where the data is from and where it is destined, along with other pertinent information. They usually also have a tail that tells the network the packet is finished. The size of each packet varies and may only be a few bytes long. Because the cables that make up networks are shared resources, it makes sense to deliver data in this way, so every data stream can be multiplexed on the same set of cables.

Message switching is an extension of packet switching, but each packet consists of an entire 'message'. In normal packet switching operations, the packet size is determined by the network protocols, not the actual data being delivered. In message switching, each packet consists of the full chunk of data.

Basic networks

Hubless Ethernet is a common form of computer network used in homes and a lot of small businesses. Rather than having devices which send data along specific

A typical network topology



network pathways to destination computers, the computers are simply daisy-chained with some coaxial cable. Packets sent by a computer on that daisy chain head in both directions, going to each computer along the pathway. Each computer will check the packet, see if that packet is designated for it, and let it go along to the next computer in the chain if it is not. Commonly, this type of network is called a bus topology because it's controlled by a central bus.

This is a very cheap and simple way to set up a network, but there are obviously some problems when scalability and reliability are important. The single cable, or backbone, which provides the link can become very congested. But perhaps the most difficulty arises because all the devices must be connected to a single cable, and the distance between devices is limited before the signal starts to degrade. To extend the line limits, devices called repeaters can be used — these regenerate the signal at a given point on the network, extending its potential reach.

When copper twisted pair came into vogue because of its higher speed, reliability and line lengths, a new system of connecting clients was required. The connection devices are commonly called *hubs*. A hub, which literally means a central point for a network or system, can actually refer to a range of devices, including routers, bridges and

switches. Quite often, though, when people use the term hub they are referring to a passive hub, which does not have routing capabilities, and which instead replicates traffic passing through the hub, broadcasting along every wire connected into its ports. Most of the hubs found in homes and small businesses will be of this type.

Hubs form the basis of a *star topology* — a central point to which a group of individual devices are connected (whether they are PCs, printers or other hubs). Networks are rarely so clear cut, however, and can often be confusing. For instance, although physically a star topology, passive hubs are logically still part of a bus topology because they have no routing function.

Passive hubs are useful on small networks, where bandwidth requirements are low, network management is largely not required, and high-level routing of information is not required (at layer 3, for instance). But when you move onto larger, more complex networks, it becomes highly inefficient for each client to receive every network packet. For this task, you need active hubs — devices which selectively send packets down specific wires, depending on the information contained in the layers of the packet. These are the bridges, routers and switches that form the mainstay of the corporate network today.

Bridges

The first commercial active hubs were called *bridges*, which were combined hardware and software devices. They have a very specific task — to interconnect local area network (LAN) segments while preventing traffic overflow as a result of too many devices connected to the same network.

A LAN, as you probably know, is simply a term for a localised group of network devices, usually connected at high speed. But in the 1980s, LANs started getting too big to have all traffic routed to all clients (as happens with passive hubs and in hubless networks). It became necessary to segment

the LAN into smaller groups, effectively breaking it up into smaller LANs—but then how does a client on one of these smaller groups communicate with a client in one of the other groups?

Bridges provide the solution. Stuck between network segments, bridges build databases of device addresses, against which they check each packet that comes their way. If the packet is destined for a device on another group, it will route the data along the line or port to which the destination group is attached. If it is destined for the same group from which it came, the bridge will return it to that network. This links several LANs into one logical LAN, without the overhead of all that broadcast information. Often, such LANs are called 'bridged LANs' or 'B-LANs'.

Bridges usually operate at layer 2 (see APC February, page 89), relying on the MAC addresses of devices for determining source and destination addresses. Operating at layer 2 makes it independent of the physical layer (layer 1), and thus bridges can also be used to span networks with different media—they can connect a coaxial Ethernet network to a twisted pair Ethernet network, for instance. As an added bonus, bridges also function as repeaters, regenerating the signals that pass through it.

One of the fatal flaws of bridges is that they don't handle loops very well. In complex topologies, there will probably be several paths between destination and source because of the way the sub-networks are interconnected. Think of a triangle: with points A, B and C. To get from point A to C, you could go directly to C, or you could go through B then on to C. A possible result of these loops is that packets can be bounced around the network endlessly, the bridges sending the packet back and forth in a closed loop. The solution is the *spanning-tree algorithm*. It helps bridges learn the most efficient means of getting the packet to its destination. IBM has also come up with another solution, *source-routing*, in which the packet contains routing information, telling the bridge how to get the job done.

Not all bridges are the same. They have to be designed to work with specific protocols, and they differ in the way they determine and store the look-up table that records the ports to which devices/networks are connected.

The simplest bridges have a fixed look-up table of network addresses. If a new device is added to a LAN, then the table has to be modified to take into account the MAC address of the new device—a management nightmare on large networks, although it does allow a great deal of con-

trol regarding data paths. There are also *dumb bridges*, which use the source routing technique defined by IBM.

The most common form of bridge nowadays is the spanning-tree, or *smart bridge*. These monitor the source address of packets they receive and build a dynamic database of device locations. The port from which a packet comes in is linked to the sending device, indicating the port to which future packets addressed to that device should be sent. If it receives a packet, and doesn't have the destination device listed on its look-up table, it broadcasts the packet on all network segments. The response from the destination device is then logged and added to the device database, so future packets will be sent directly to the correct port. On complex networks, this broadcasting of information can lead to *broadcast storms*, which can bog the network down quite a bit—this is one of the necessary evils of routing at layer 2. To get around this, you would need to use the network layer.

Routers

Routers represent the next stage of development. Bridges worked just fine for LAN situations, but the use of MAC addresses means they are next to useless when the network expands beyond the LAN, into the wide area network (WAN). WAN refers to a network spread over a wide area, or more technically, the difference between a LAN and a WAN is the need for layer 3 routing.

Simply put, routers operate at layer 3, sending packets directly to their network destination. They forward packets, rather than filter them as bridges do. They read deeper into the packet than bridges, extracting the network address of the destination device to allow global routing. This 'deeper scan' means that they operate slower than bridges—by a factor of about 10—but they do provide many more management features and allow routing over large-scale networks (the Internet, for instance, would not be possible without them). Routers are also better at handling extras like traffic prioritisation, security and multicasting, but these again cause a performance hit. They often communicate between each other to find the best destination path.

Early routers were designed to deal with specific layer 3 protocols like IP, or DECnet, but more recent models can deal with multiple protocols (earning them the name multiprotocol routers). There are also some devices which actually take on both routing and bridge functions. Called bridge-router hybrids, or brouters, these devices will route some protocols, while bridging others.

Switches

Routers and bridges have proved to be useful, but they are often too slow or too expensive for modern networks. For this reason, network device vendors introduced a new class of device called a *switch*. Switches work, in principle, a lot like routers and bridges, but much faster. For instance, a bridge or a router will wait for an entire packet to arrive before it sends a packet along a given wire, but many switches will simply read the header of an incoming packet, and before the packet fully arrives, connects the incoming and outgoing lines so the packet flows through with minimal latency.

There are several types of switches, the most common being layer 2. Layer 3 has come into vogue in the last few years and layer 4 is beginning to emerge.

Layer 2 switches are simply faster bridges. They operate very much like bridges, and they route at the same level, the data-link layer. The primary difference is in their speed: the layer 2 switch generally uses specifically built circuits that allow routing without significant pause at the switch. They learn MAC addresses the same way bridges do and have the same problems: broadcast storms, small address spaces, and spanning-tree loops.

Layer 2 switches do have several advantages over standard hubs and bridges. Each port can have dedicated bandwidth, and collisions between packets are better handled. Parallel data flows are often possible. Importantly, they can also restrict broadcasts to certain network segments.

Layer 3 switches perform a hybrid of routing and bridging functions. They work a bit like the brouters we mentioned earlier, performing layer 3 routing on some protocols (usually IP and IPX) and layer 2 switching on others.

A debate is raging at the moment about the merit of packet-based switches and cut-through layer 3 switches. The former deals with each packet that comes through individually, routing it at level 3. The latter, however, will detect whether a stream of packets to the same destination is forthcoming, and if it is, will start using layer 2 to switch future packets, which is much faster than routing at layer 3.

A new development is so-called layer 4 switches, also known as layer 3 plus switches. These have improved the management of traffic flow, prioritisation of certain data and allocation of bandwidth—in other words, they deliver better quality of service to devices on the network.

Next month: Some of the protocols that make networks work.

Maintaining your printer.

By Daniel Rutter

Step by Step

I covered general computer maintenance in last month's column. This time I'm tackling maintenance of the biggest mechanical component in the average computer system — the printer.

Plug your printer into a power filter — a proper line conditioner, by preference, not just a spike/surge filter (for more information on power conditioning, see APC July 1998, page 146).

Resist the urge to oil your printer. If it uses plastic gears, oil won't make them work any better and it may attack the plastic. If it uses metal gears, they probably aren't loaded heavily enough to require additional lubrication. If you must lubricate moving parts, do it with a light grease. Lithium grease is available at electronics stores, and it does a good job, but apply it sparingly, as grease in your printer's paper path is a *bad thing*.

For most printer cleaning, the manufacturer-approved damp soft cloth is fine. If ink has found its way onto the paper guides and water won't shift it, you can swab it off with cotton buds and methylated spirits. Wiping the whole printer with metho, or any other solvent, is unnecessary.

When working on any inky printer — inkjet or dot matrix — use disposable gloves, unless you like that 'I've been writing with a quill pen' blotchy-finger look. Plastic gloves from a pharmacy are perfectly adequate, but you shouldn't use them when working on static-sensitive devices. Latex surgical gloves are harder to find, but better than plastic ones. Plus, they make you look a lot more dangerous.

In last month's column, I recommended an 'air duster', which is just compressed gas in a can, for easy cleaning of computer components. Do not use an air duster to blow crud out of your printer, unless you're sure you'll actually

be blowing the crud *out*, and not sending it deeper in. A light dusting of spilled toner in a laser printer is perfectly harmless, if it's not in the paper path. Even if it gets on the paper, as long as it's not before the paper's ironed by the fuser roller, you'll just be able to blow the unfused toner off again. But if you assault the dust with a hundred mile an hour air blast, you may well squirt it right onto the fuser, from which it can be rather difficult to remove.

Inkjets are easy

These days inkjets (including Canon's 'Bubble Jets') are largely maintenance-free. Modern inkjet cartridges include the whole print head, which is why they're so expensive. Inkjet print heads, therefore, seldom get the chance to get dirty or become clogged.

If your cartridge *does* manage to block up it usually occurs if you don't use the

cartridge contacts. Dry the nozzles by lightly touching them with a paper towel and you may have a working cartridge again. Bear in mind, though, that many 'clogged' inkjets don't actually have a blockage at all, and it's usually some other problem with the cartridge.

Dot matrix maintenance

Dot matrix printers are still popular with skinflints and those who need something that can print on multi-part forms. Many of these business printers are old warhorses with a lot of miles on them.

If your dot matrix is an essential component of your business, check how it moves its print head side to side. It's probably a belt drive. Get a spare belt now. That way you can just swap the new belt in yourself, or have it ready for the repairperson, if the old one snaps. There are many different belt sizes, and belts for older printers can be hard to find.

Dot matrix print heads run hot. Most of them have an impressive array of cooling fans. Most of these will fail when overheated — they're meant to shut down when they're too hot, but they don't always do it in time. So a borderline printer may be fine for any number of small documents, but it may die after 50 pages of your priceless thesis.

Not surprisingly, dot matrix printers like a bit of airflow, and shouldn't be surrounded by stuff or be positioned in direct sunlight.

'Refreshing' dot matrix printer ribbons with spray-on oil, generally WD-40, is a fairly popular practice. It may or may not be a good

idea, depending on who you ask. Dot matrix ink contains lubricants designed to grease the print head and keep it working properly. WD-40 is lousy for this job, generally speaking — it's good at



The heat warning sticker is not a joke. Also note the somewhat grimy gears. They don't need cleaning, and they don't need oiling.

printer very often, live somewhere fairly dry and warm, or refill a cartridge over and over. When a cartridge becomes clogged, try trickling hot water over the nozzles, making sure not to touch the

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stopping squeaks, and it *will* make your ribbon print black again, but it may not be an adequate replacement for the original oil. Again, this is a problem which may only manifest when the printer's working hard — which is probably the exact time when you least want a print head to die.

The simple way to deal with a worn-out dot matrix ribbon is to buy another one. The per-page print cost of dot matrixes is far below that of other printers, so you've got to be a pretty severe penny pincher not to want to replace the ribbon.

This would be a good time to mention that I *am* a pretty severe penny pincher — I must be, because I own a dot matrix ribbon re-inking machine, and several bottles of the greasy, evil ink. The re-inker did pay for itself — after about five years. If I were you, I wouldn't bother.

Lasers

In a laser printer, there's a photosensitive drum that's electrostatically charged to about -6,000V by the 'main corona wire'. Light, usually from a laser, is shone on those parts of the drum that correspond to black on the printed page. The light causes the drum's charge to drop to about -100V. A roller then applies a layer of toner to the drum. The toner is repelled by the strong charge on the bits of drum not painted by the laser, so only the desired areas are still black when the drum rotates further. A positively charged 'transfer corona wire' under the paper pulls the toner from the drum to the paper. The drum is wiped clean, its charge is neutralised by an eraser lamp and the process starts again, while the paper moves on through the heated 'fuser rollers', which iron the toner onto the page. The fuser roller which comes into contact with the toner is also wiped clean by a 'fuser wand', which may be part of the cartridge along with the fuser itself or may be a separate component.

If your printer has a separate fuser, new cartridges probably come with a new fuser wand. It's possible for the wand to get dirty before the cartridge is

out of toner. The scunge on a dirty wand can gouge the surface of the fuser and create vertical stripes on your printout.

Fortunately, you can easily remove built-up crud from a fuser wand by



Some laser printers, like this Hewlett-Packard LaserJet, come with a cleaning brush and full instructions on how to use it.

scraping it with a coin. Pluck off any fluff by scraping it, and pop the wand back into the printer. Turn laser printers off a quarter of an hour or so before you crack the case and start fishing around, as the fuser rollers are hot enough to burn you when the printer is in operation.

Do not touch, or even look at, the photosensitive drum in your printer cartridges. It can be harmed by light and the oils on your fingertips. Most cartridges have a spring-loaded door over the drum; it's there for a reason. You can clean gunk off the drum by wiping it with a soft, dry, lint-free cloth; if you must, do it in dim light. You will probably never have to. Crud on your pages is probably the result of dirty fuser rollers.

Generally speaking, if you're cleaning a laser printer and don't know what a component is, don't touch it. Briskly rubbing down a charge transfer roller can kill it.

Laser printers with a corona wire to charge the photosensitive drum usually have an ozone filter in them somewhere. Ozone is a health hazard; if there's a strong ozone smell around your printer, the ozone filter is probably clogged, which apart from its potential to damage your lungs, also means your printer is not getting as much airflow as it needs.

The filter is often part of the print cartridge; if so, just get a new cartridge.

You can get 'cleaning paper' for laser printers, which aims to grab dust and toner from the guides and rollers inside the printer. Cleaning paper can do quite a good job, but it can't touch dust or toner that isn't presently on the paper-touching components — vibration and air movement can float this crud into the paper path right after cleaning. Some laser printers can print their own 'cleaning page'; some do it automatically when you shut them down.

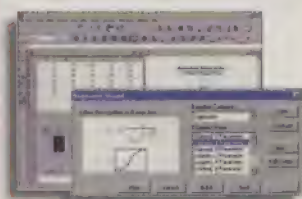
Some people have a morbid fear of laser printer or photocopier toner, believing it to be an incredibly deadly poison or carcinogen or some such. This fear is unwarranted. Toner is part plastic and part carbon, as a very fine powder. When it's heated, the

plastic melts and can be ironed onto the paper by the printer's fuser — the carbon provides the black colour. Neither the plastic nor the carbon is a danger to humans, per se, except for the fact that fine powders are easy to inhale, and inhaling any fine powder is bad. Toner is no more dangerous than talcum powder; if you absent-mindedly blow into a spillage and get a face-full of the stuff, just try not to breathe it in, and don't worry about turning into one big tumour overnight.

Toner can, however, be lethal — to vacuum cleaners. Do not vacuum up toner spills. Toner is so fine that it can pass through the pores in a vacuum cleaner bag, and it's specially designed to melt together when it gets hot, and it's full of conductive carbon. Vacuum cleaners keep their motors cool by letting the airflow blast straight through them. Can you see the problem here? Sucking up a pile of toner will, at best, result in some of the toner being blown straight through the cleaner and all over the place, while the rest of it gums up the motor. At worst, your vacuum cleaner might catch fire.

Feedback and suggestions are welcome at dan@dansdata.com.

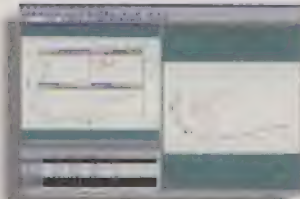
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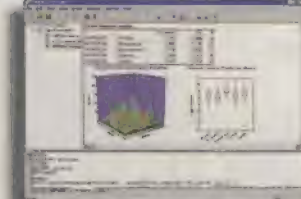
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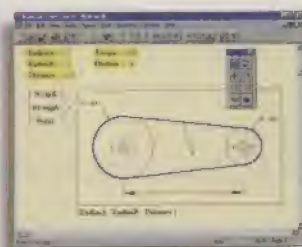
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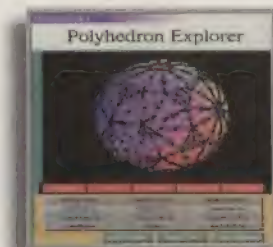
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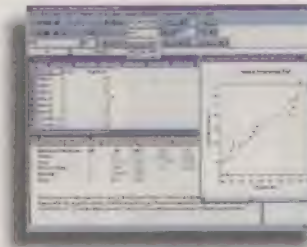
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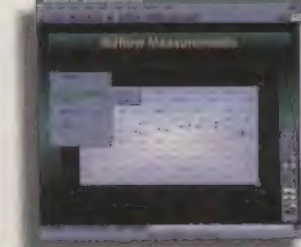
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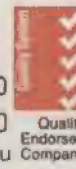
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Quick Launch and the Start menu.

By Kieran McNamee

Windows 98

One of the most notable differences between Windows 95 and Windows 98 is the addition of the Quick Launch toolbar. It seems that a new way of loading programs comes with each new chapter in the Windows saga. Along with the new Quick Launch toolbar, the most popular method of loading programs in Windows 98 is through the Start menu. This month we will be looking at how to make effective use of these two features of Windows 98. If you think that learning how to start your programs is a tad elementary, don't be fooled — there's a lot to learn.

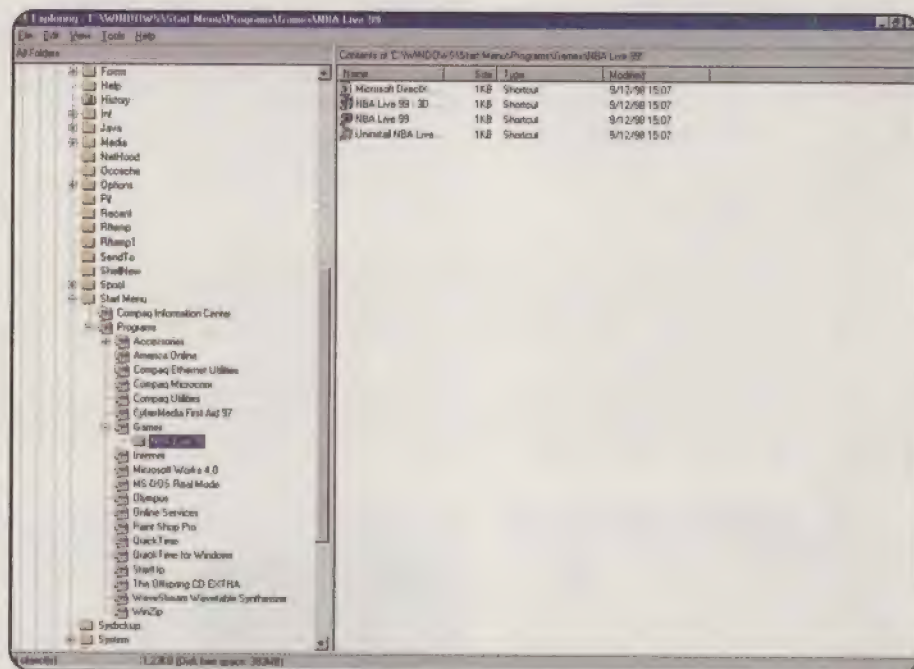
Quick Launch

For those readers who still have Windows 95 and are feeling a bit left out, you will be pleased to know that you too can get the Quick Launch toolbar simply by installing Internet Explorer 4.

The Quick Launch toolbar provides a quick and simple way to load your programs. This toolbar is not the place to put shortcuts to all of your programs — that's the role of the Start menu. The Quick Launch toolbar should only contain a few shortcuts to the programs you use the most, or those that you need to access quickly. I recommend no more than half a dozen or so shortcuts on the toolbar or there will be no room left on the taskbar to display all your open programs.

The Quick Launch toolbar provides many advantages to Windows 98 users. It offers one-click access to the programs you use the most. There is no need to wade through layers of Start menu folders just to find the application shortcut you want. The toolbar can remain on the taskbar near the Start button or can be relocated by dragging the front part of it to another location.

If your Quick Launch toolbar is not already visible, then all you have to do is



right-click the taskbar and choose Quick Launch. To add icons to the Quick Launch toolbar, simply drag and drop the program's shortcut from your Desktop, the Start menu, or Windows Explorer onto the toolbar. Getting rid of unwanted shortcuts is easy — just drag them to the Recycle Bin.

To make the most of the Quick Launch toolbar, you must carefully choose the shortcuts it will contain. The default shortcuts include Internet Explorer and the Control Panel; but you don't have to keep them both there. If you are fond of multitasking and often have more than one or two windows open at once, you will find the Clear Desktop icon extremely useful. It is much easier to click this icon than to right-click the taskbar and select Minimize All Windows.

You should probably consider adding your Internet applications to Quick Launch. You probably have an email program and a browser you always open when you connect to the Internet, perhaps

even a chat client. Putting these programs on the Quick Launch toolbar allows you to save valuable seconds that could be spent surfing the Web, and more importantly, it saves you from making repeated trips to the Start menu.

Productivity tools are usually in high demand, so it's a good idea to include a Quick Launch shortcut to your word processor, and depending on what type of work you do, shortcuts for spreadsheets, databases and graphics programs. Remember to limit your shortcuts to the ones you use the most.

Of course, if you are like most people, you will get the urge to have a game of solitaire every once in a while. A pack of cards certainly makes the Quick Launch toolbar more attractive.

An alternative way to work out what programs to include in your Quick Launch toolbar is to continue using the Start menu to load programs, and take note of the programs you load the most.

Start menu

It's all well and good to have your new Quick Launch toolbar set up for effective use, but you must also ensure that your Start menu is set up properly as well. After a while, that Start menu can get bloated and very disorganised. Having to trawl through layers of submenus to get to the shortcut you want is a waste of time, and can be very frustrating.

As each new application is installed on a system, it follows that there will be new entries in the Programs section of your Start menu. These entries are often just a waste of space, making the menu longer and not providing much benefit. For instance, if you install any of the shareware programs from each month's **apcmag.cd** without subsequently uninstalling them, you will soon have a Start menu that requires two columns and is too confusing for you to find the program you want.

More often than not, these installation programs put several shortcuts into a submenu with a name that you would not usually identify with the application being installed. It's hard enough finding a shortcut when you can identify the submenu it would fall under. Moving such shortcuts to somewhere else in the Start menu is a good idea.

Organising your Start menu is a fairly tedious process, but it is well worth the effort. To edit the Start menu's contents, right-click on the Start menu and choose Explore. The way you organise your Start menu is a subjective task, but the following guidelines may help.

Let's start by looking at the first level of the Start menu. Here you will find a number of important items. There is no need to look at them in detail, as they are all reasonably useful and do not provide much of a hindrance. There is one item, however, that many people want to remove from the Start menu: the Suspend command. If you never use Suspend and want to get rid of it, then open the Power applet from the Control Panel and click Advanced. Then uncheck the 'Show Suspend command on Start menu' check box.

This first level of the Start menu is divided into three sections — the top section is available for your own shortcuts. Shortcuts in this section of the Start menu are not as quickly accessed as those in the Quick Launch toolbar, but it is a good place to put

utilities you use once in a while but which aren't easily accessed. An example is the Add/Remove Programs utility — you'd normally have to go through the Start menu and then the Control Panel just to get to it.

Now we come to the most important part of the Start menu, the Programs section. The Programs' submenu can make or break the effectiveness of the whole Start menu. If you can manage to have less than a dozen submenus then you are doing well, and everything will be a lot easier to navigate.

New submenus need to be created, and unnecessary ones need to be removed. There are many categories of submenus you can use. Instead of having a submenu for each individual shortcut, you can group similar shortcuts together in one submenu. For instance, all your Internet applications can be grouped under an Internet or Communications submenu.

You can also remove all the shortcuts to Readme and help files that are bundled in by installation programs. You can always find these same things from within the program once it is running.

You will want to keep the Accessories and the StartUp submenus, and it is a good idea to leave the Windows Explorer shortcut where it is, so it can be found in the same place on all computers. That way, if someone else uses your computer, they know where to find it.

Some categories that you may want to consider filing your shortcuts under include Games, Internet, Productivity, Graphics, Multimedia, and of course, Microsoft. Don't be afraid to make use of multiple submenus. If you have a whole pile of games you may want to organise them further with additional submenus such as Racing, Combat, Card and Sport.

Other loading methods

The Start menu and Quick Launch toolbar are probably the two most popular ways of loading programs in Windows 98, but you can't forget about the desktop, the system tray or the multitude of shortcut keys that

can be used to make loading programs that little bit easier.

The desktop is the main area of Windows 98. You have the wallpaper in the background and icons in the foreground. The number of icons on the desktop varies from user to user. Some people fill the whole desktop with icons, some place them strategically around the edges, while others just leave the original icons as they are and don't bother adding their own.

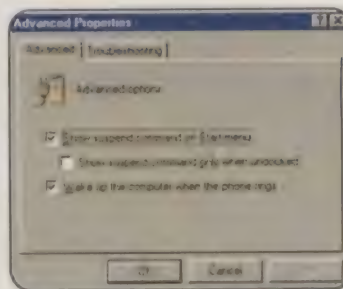
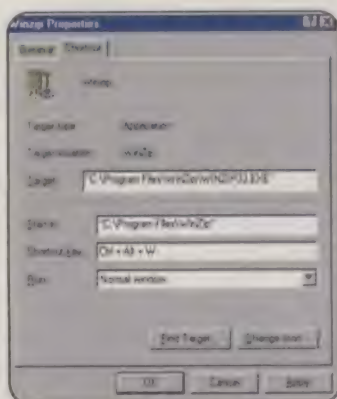
There are some things on the desktop that many people will never use. The Briefcase, Internet, Microsoft Network and Inbox icons are all potential deletions. Unfortunately, removing these icons is not as simple as pressing the Del key. You will have to use something like the TweakUI utility from the Microsoft Shell development team to get rid of them.

The system tray is not a location where you create your own shortcuts (though there are programs that will help you do this). The system tray is where a number of programs put themselves when they are running in the background. Programs such as antivirus utilities, 'crash guards' and the ICQ communications program have their icons in the system tray, and these icons usually provide notification when a particular event occurs. You can load any of these programs by double-clicking their system tray icon.

After creating a shortcut, you can elect to assign a shortcut key combination to provide a fast way to load the program. If you like using the keyboard then this way is even better than the Quick Launch toolbar. Right-click the shortcut icon and click on Properties, then select the Shortcut tab. Clicking in the textbox labelled Shortcut key will allow you to assign the shortcut key combination that you want. The combination involves the Ctrl, Shift or Alt keys and then an alphanumeric or function key.

The benefits will emerge

It may not be immediately evident that this reorganisation is actually a good idea. In a few days, however, you will realise what a difference these changes have made and you will never want to go back to a cluttered Start menu or a world without Quick Launch. ■



Why some Windows users are moving to OS/2 for their more intense multimedia requirements. **By Christopher Relf**

OS/2 Warp

Believe it or not, the term 'multimedia' once meant that your PC had a soundcard with an output marginally better than the PC speaker — oh, how multimedia has changed. The actual meaning of the word multimedia depends on your use. Some say it means that the PC can communicate with you, the user, through more than one sense. Using this translation, all PCs have multimedia technology: a keyboard, a mouse, a monitor, and a PC speaker are all communications media, in one way or another. This definition is a little out of date for the computer market, though. Today's PC resellers claim 'superior multimedia performance', 'enhanced multimedia tools', and 'multimedia components included'. Do they know something we don't? This month we'll have a look at why OS/2 is so good for multimedia.

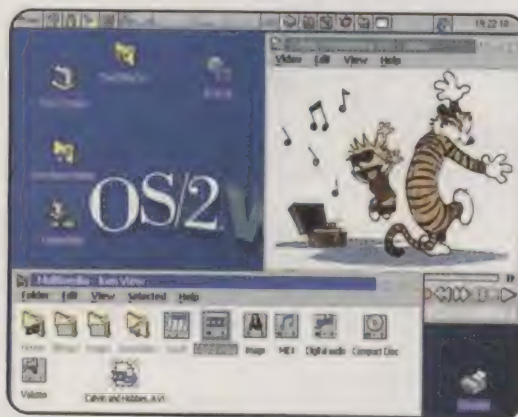
What is multimedia?

Computer multimedia is a mixture of things: sound, images and moving video. The ability to play music in many formats (for example, wave, MIDI and MOD files), view pictures (JPEG, bitmap and TIFFs), and watch movies (AVI, MPG and RealVideo) is often taken for granted on our modern PCs, but it's been a hard slog for software and hardware developers over the years, especially when it comes to agreeing on standards. For example, image files (often called 'pictures') can come in so many different formats, yet look the same when viewed. Therefore, it is often difficult for operating system developers to choose which formats the operating system should support, and which ones to leave for the user to find a third-party vendor application to display.

Multimedia can flow both ways, as input and output. These days, a lot of OS/2 users are talking to their PCs, dictating APC articles, for example! Also, with the high cost of long-distance phone calls today, Internet telephony and real-time video phone calls are becoming much more common.

Stability and speed

We must come to terms with the fact that OS/2 Warp 4 was not developed for the home market. IBM targeted it quite strongly as an enterprise client system —



and that means business. But this still leaves the question of why the developers of OS/2 didn't write multimedia code to just do the basics with a handful of popular soundcards (well, the Sound Blaster from Creative Labs, at least). Mind you, I'm glad they didn't!

Currently, a typical use of the OS/2 platform is in information kiosks. Often what looks to be a really neat Windows 3.11 application at a trade show's information kiosk is actually an OS/2 Warp application. Why? *Stability*. Kiosks are designed to operate under extreme conditions with even more extreme users — people that may have never used a computer before. If a situation occurs where the conditions the kiosk is experiencing aren't ideal, the developer wants to be confident the system won't fall over, so they often choose OS/2. Another facet that determines the success of the kiosk (and thus the product) is the way the information is presented. One of the three major keys to clients remembering your presentation is sense stimuli — the prettier the pictures, the clearer the sound, the smoother the video, the better the impression.

The developers of OS/2 Warp 4 built in a few interesting bits and pieces to ensure that your multimedia isn't dogged by slow data access or hardware imperfections.

The first major improvement is the high performance file system (HPFS). Sound and picture data can be very large (depending on the compression used by the file format), and getting it from your hard drive to your RAM, output devices, and to the user can be difficult at the best of times. If you have a wave file that is sampled at 11,025 bits per second, you would want to make sure that your hard disk can read the information back with a speed *at least* that of the original file, otherwise you're going to miss out on some of the data. (This is a simplified example, but you get the idea.) Putting the file allocation table (FAT) in the middle of the drive speeds things up dramatically — the head(s) of the hard drive has to travel less distance, on average, across the surface of the drive to find the information it's looking for. Although seek times are already quite fast, you will notice lagging in full-screen, full-resolution video because of this effect.

Hardware access

OS/2 Warp 4 was released with a comprehensive Device Driver Pak (DDPak) on a separate CD-ROM. This gives you access to over 3,900 drivers to support hardware, including multimedia products. If the driver you're looking for isn't on the CD-ROM, chances are it's mentioned and there will be a link to an external site where you can download the driver. IBM has a 'vendor agreement' with the third-party developers — each of the vendors that have written drivers on the DDPak have agreed to support their own software, and IBM has agreed to distribute it with OS/2. This means that although a lot of hardware is supported when you install OS/2 itself, you can find almost everything else with the help of the DDPak CD-ROM.

If you're not sure your hardware is supported on the OS/2 platform, check out <http://service.software.ibm.com/os2ddpak/>. This site has the updated DDPak online — over 4,500 devices are supported, from printers and soundcards, to monitors and video cards. The site also contains all the drivers on the DDPak CD-ROM that comes with OS/2, but a lot of

COUNTDOWN 1 10 9

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them have been updated. If you're using an old version, it may be worthwhile visiting the site for the latest drivers.

More on drivers

Over 600 drivers have been added since the original DDPak was released, and this has a lot to do with the OS/2 graphics adapter device driver (GRADD). Often, hardware developers write drivers for their video cards that support almost every operating system you could think of, except for OS/2. This can be for several reasons: first, writing a display driver is not an easy task — the developer must know about both the hardware and the operating system. Windows was easily the most popular operating system in the past, so writing a driver for OS/2 was considered unimportant. Now that users are beginning to use OS/2 and other operating systems, such as Linux, instead of (or as well as) Windows, display drivers are receiving more attention. Anyway, GRADD moves a lot of the code that used to be embedded deep within the video drivers into the OS/2 video interface; therefore it takes much less time and knowledge to write a video driver.

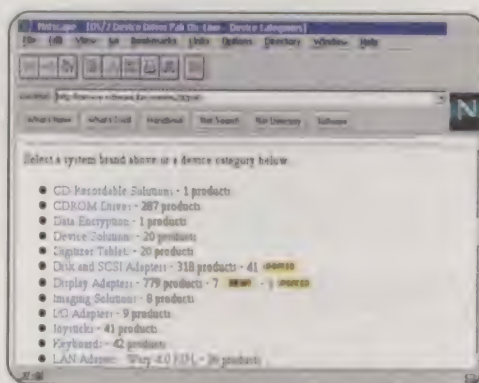
One of the great qualities I've admired in many OS/2 users is their loyalty to the platform. Even if a particular soundcard vendor (for example, Gravis with its Ultra-Sound soundcards) have other priorities which prevent them from writing OS/2 drivers, often a user will write one for general use (in this example, Manely).

DIVE and DART!

So now that we can access the hardware through drivers, what do we do? Well, through this technology, we can interrogate the video drivers much more deeply than before using direct interface video extensions (DIVE). You can get better video performance using DIVE, as it provides the developers with a way to bypass some of OS/2's eccentricities. This means faster screen updates and, ultimately, smoother motion video. A lot of the time, video is represented by what is called a 'bit-blit' technique — the original bits of an image are moved in the next frame, or 'blitted' (block transferred) to another part of the screen, suggesting motion. OS/2 Warp 4 has an optimised DIVE library that supports blitting, and can exploit the characteristics of any video acceleration hardware you may have.

The direct audio real time (DART) interface is similar to DIVE, but it's for

sound. OS/2 handles audio multimedia through several layers. For example, if you select and begin playing a wave (WAV) file, then it will first be played by a multimedia wave-file player, then it will be sent to a mixer to be combined with the sound data that may be coming from your CD-ROM, line input or microphone, and only then will it be sent to the soundcard. This is OK if you're just playing around with a couple of files on your desk-



top, but if a time-critical game is involved, then the delay while all this takes place is quite unacceptable.

The answer is to use DART. Software developers can access the soundcard directly without any interruptions. But beware: if you're running more than one DART-enabled application at once, make

sure they know how to behave! OS/2 does its best to share the soundcard (or even deny access to all but one of the applications), but if they have been written using sloppy code, you could run into problems when two or more of the programs try to access the soundcard at once.

Other interfaces

OS/2 Warp also supports the cross-platform OpenGL interface designed by the wonderful people at Silicon Graphics. OpenGL was written to assist developers in writing graphics applications on several platforms at once.

Playback of FLI and FLC animations previously had some bugs on the OS/2 platform, but if you open the OS/2 version of Chess, you'll see a cute little animation that is, of course, in FLI format. The explanation was new to me — if you have an FLC animation (say APC_OS2.FLC) and a wave file of the same name (say APC_OS2.WAV), then OS/2 will play them simultaneously, as if the sound is connected to the movie — a great idea!

Next month

We'll be covering a little more about OS/2 multimedia next month; in particular, that mysterious MMPM/2 and the multimedia applications that come bundled with OS/2.■

DDPak on-line

The following table is a partial listing of what's available at the DDPak On-line site (<http://service.software.ibm.com/os2/ddpak>).

Product	Devices supported
CD-Recordable solutions	1
CDROM drives	287
Data encryption	1
Device solutions	20
Digitiser tablets	20
Disk and SCSI adapters	336
Display adapters	779
Imaging solutions	8
I/O adapters	9
Joysticks	41
Keyboards	42
LAN adapters	468
Mice and Trackballs	123
Miscellaneous	1

Miscellaneous storage	98
Miscellaneous wireless	13
Modems	110
Multimedia audio	151
Multimedia laserdisc	3
Multimedia MPEG	12
Video acceleration	11
Video capture	29
Optical drives	8
OS/2 component updates	25
Installation disk images	4
Printers and plotters	1239
Removable disks	4
Systems	1661
Tape support solutions	19
Universal Serial Bus (USB)	1
WAN	16

As you can see, there's plenty out there, so stop complaining that OS/2 doesn't support your hardware!

Putting Sherlock on speaking terms with your favourite search engines. **By Stephen Withers**

Mac OS

Sherlock, the vastly improved replacement for Find File, is one of the leading features of Mac OS 8.5. In turn, one of the leading features of Sherlock is its ability to access Internet search engines.

Mac OS 8.5 ships with plug-ins to support a few of the leading search sites, but many more are available on the Internet. Apple has a page for this purpose (<http://www.apple.com/sherlock/plugins.html>), but the best place to look is CNet's Download.com (go to <http://www.download.com/> and search for 'Sherlock').

Several of these plug-ins access the search facilities of sites that are database-driven (meaning that instead of page after page of static HTML code, the content is stored in a database and the information requested is wrapped in HTML for display on a browser). The content of such sites is less likely to show up in traditional search engines, which work by following links between pages. You therefore need to explicitly search that site using its own search engine.

But what if you know several sites that cover the same sort of material? That's where Sherlock comes in. If you have a plug-in for each site, you can search them all in one go.

All this is fine if plug-ins already exist for your favourite places on the Web. If they don't, you'll be glad to hear that it isn't too hard to write one yourself.

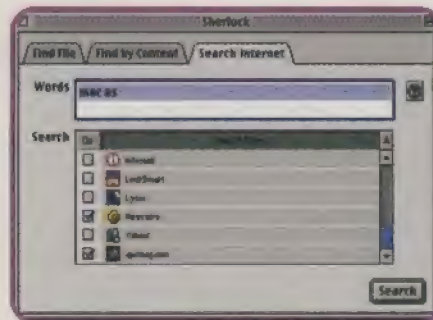
You don't need much in the way of tools: a text editor (SimpleText is fine as the plug-in files are quite small), a utility to change the file types and creators (try a contextual menu add-on such as More File Info), and an icon editor (if you want to go to the trouble of preparing a custom icon).

Using your browser, you'll also need to save the HTML code for the page containing the search form that your plug-in will access (don't forget to record its URL too), and the HTML from a successful result. You should also download Apple's Tech-note 1141 'Extending and Controlling Sherlock and the Find by Content Libraries' (<http://developer.apple.com/technotes/tn/tn1141.html>).

Although it's possible to work from scratch, it's usually easier to start by modifying a plug-in for a site that bears some resemblance (in terms of the HTML it sends for the search and results pages) to the one with which you're working.

My first project was a plug-in for APC's **NewsWire** site (<http://newswire.com.au/>), and an examination of the HTML involved suggested the Excite plug-in was the closest match.

The first step is to duplicate the file you're using as a basis for your project,



rename the copy appropriately, and then change the type and creator to TEXT/txt.

Open the file, and you'll see a fairly familiar format. Apple has created a language it calls Internet Search Interface Language (ISIL) which bears a passing resemblance to HTML.

The plug-in contains three major elements; the 'search', 'input' and 'interpret' sections. As you'd expect, search tells Sherlock how to talk to the search engine, input transfers the search string from Sherlock to the search engine (logically, rather than in the sense of actually communicating with the engine) and interpret tells it how to identify the results from the rest of the HTML that's returned.

Search

The search section starts with {search followed by some parameters and a closing }. There are three mandatory parameters: name, method and action.

Name is the name of the search engine. In our case, that's 'NewsWire'.

Method is either 'GET' or 'POST'. You

can find which to use by looking at the form definition.

Action specifies the URL that must be sent to initiate a search. The best way of determining this is to look at the URL displayed in your browser's Address (or URL) field when it is displaying a search result. Copy this directly from your browser and paste it into your plug-in as a line on its own. Beware of sites using frames — you may need to use the browser's Open Link in New Window (or equivalent) command from the page that links to the search page in order to display the true URL in the Address (or URL) field.

For example, searching for 'Mac OS' in **NewsWire** with the other fields left at their default produces:

```
http://newswire.com.au:8008/apcweb/news.nsf/bydate?SearchView&Query=Mac%20OS&SearchOrder=1&SearchMax=0&SearchWV=TRUE&SearchThesaurus=FALSE
```

Type a '#' in front of the URL to turn it into a comment (in case you forget to clean it up later), then copy the first part of the URL but *not* any parameters. Typically, you'll need everything up to but excluding the first ampersand (&).

So the first part of our **NewsWire** plug-in looks like this:

```
{search
  name="NewsWire"
  method="POST"
```

```
  action="http://newswire.com.au:8008/apcweb/news.nsf/bydate?SearchView"
}
```

Yes, I did change the backslash in front of news.nsf to a slash — URLs shouldn't contain backslashes, but it doesn't really matter here.

Next comes input. The required minimum takes the form:

```
{input name = input name user}
```

where *input name* is replaced by the name of the field in the HTML form that takes the search string. In the case of **NewsWire**, we have:


```
[input name="Query" user]
```

If additional field values can or must be sent to the search engine, they are specified by adding more input tags of the form: `[input name = input name" value = value]`, where *value* is the value you want to assign to the field.

We've already got the full URL in our file, so we can copy the field names and their values into input tags and end up with:

```
[input name="Query" user]
[input name="SearchOrder" value "1"]
[input name="SearchMax" value "0"]
[input name="SearchWV" value "TRUE"]
[input name="SearchThesaurus" value "FALSE"]
```

You may wish to change some of the values to alter the search engine's behaviour, for example the SearchMax parameter restricts the number of matches returned (0 means no limit).

Interpret

You can leave out the interpret section completely, and Sherlock will make a 'best-effort' attempt to display all the links on the page. Depending on the site, this may be reasonably useful (as it is with **NewsWire**, which returns a page with no other links) or it may be cluttered with links to other parts of the site, ads and so on.

If you are writing a Sherlock plug-in for your own site — or one where you have influence over the Webmaster — you can add comments to the HTML returned by the search engine to more easily identify the actual results from the noise on the page and from each other. Otherwise, you must dig through the HTML for strings that allow you to identify the data that's being returned.

The three most important things to identify are the start and finish of the list of results, the individual results, and the relevance rankings. I found it best to add

these progressively, otherwise you don't know which of your statements is in error.

For **NewsWire**, the beginning and the end of the results is easy to identify, as it is presented as a table. The first cut of the interpret section is therefore:

```
[interpret
resultListStart="{TABLE}"
resultListEnd="{/TABLE}"
]
```

Further examination of the HTML shows that individual results are preceded by `[TR VALIGN=top]` and followed by `[BR]`. Adding this to the interpret section gives:

```
[interpret
resultListStart= "{TABLE}"
resultListEnd="{/TABLE}"
resultItemStart="{TR VALIGN=top}"
resultItemEnd="{BR}"
]
```

Unlike the resultListStart and resultListEnd clauses, this does make a difference to the way Sherlock presents the results, as a messy non-printing character is removed, and the ranking score is shown in the detail pane, but not in the results list.

To display the relevance properly, we must add relevanceStart and relevanceEnd clauses. The corresponding fragment of **NewsWire**'s HTML is:

```
{IMG SRC="/icons/vwiconsr1.gif" BORDER=0 ALT="99%"}{TD}
```

so we want the bit between ALT= and `{/TD}`. Fortunately, Sherlock is smart enough to discard the quotes and interpret the percentage for itself.

Our finished interpret section will be:

```
[interpret
resultListStart="{TABLE}"
resultListEnd="{/TABLE}"
resultItemStart="{TR VALIGN=top}"
resultItemEnd="{BR}"
relevanceStart="ALT="
relevanceEnd="{/TD}"
]
```

Before testing your plug-in, or any change to it, you must save the file from the editor you are using (it isn't necessary to close it completely), change its type and creator to `issp/fndf`, and then drop it onto the System Folder. If you've set the type correctly, it will be automatically routed to the Internet Search Sites folder. You may find it more convenient to create an alias

of Internet Search Sites in the same folder as the plug-in you're developing.

Note that no syntax checking is done on your code, so most errors (especially the ones that are blindingly obvious in retrospect) merely cause Sherlock to fail to find what it is looking for. One thing I discovered was that unbalanced quotes can result in an 'out of memory' error.

The complete **NewsWire** plug-in (and one for **apcmag.com**), is on this month's **apcmag.cd**.

Going further

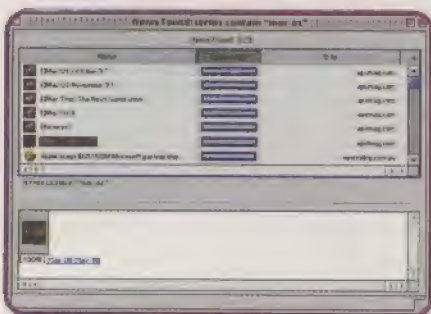
As you will discover if you read TN1141, I haven't described every part of ISIL.

One particularly sensible feature is the mechanism for updating plug-ins. You can include a URL where the most up-to-date version is stored, and the frequency with which Sherlock checks for an update. If the version on the server is more recent than the one installed, Sherlock will ask you if you want it to fetch the update; if you do, it will download it into the Internet Search Sites folder. This is achieved by adding update and updateCheckDays clauses to the search section.

The ability to automatically update plug-ins is very important, as even a small change made to the HTML generated by the search engine can break a Sherlock plug-in. If Sherlock offers to download an updated plug-in, I strongly recommend you allow it to do so.

Sherlock also recognises the commercial reality of the Web, in that many sites exist only because of advertiser support. Consequently, it provides for the retrieval of banner ads. When writing a plug-in, you can specify a URL from which a banner can be loaded, and another giving the destination when the user clicks on the banner. This information is also added to the search section of the code, but this time as `bannerImage` and `bannerLink` clauses.

Depending on the site, a different banner may be returned with the search results, chosen either at random or according to the nature of the search. ISIL provides a facility to process these banners. In the interpret section, include `bannerStart` and `bannerEnd` clauses to identify the start and finish of a banner specification in the search results (in a similar way to the `resultItemStart` and `resultItemEnd` clauses). Sherlock will use the first image and URL in the text bracketed by `bannerStart` and `bannerEnd` as a banner, overriding those specified by `bannerImage` and `bannerLink`. ■



An overview of a few of the image viewing, manipulation and creation programs available for Linux. By Geoffrey Bennett

Linux

XV

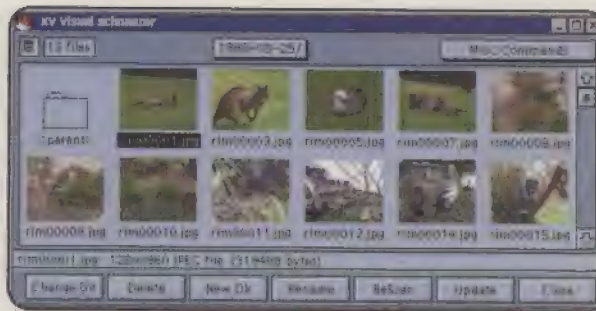
XV is a popular image viewer that can read and write many image formats, including GIF, JPEG, TIFF, PPM, BMP, PCX and TGA (you can find XV at <http://www.trilon.com/xv/>). To get started, just type `xv` (optionally, you can specify a file to load on the command line). From the main XV controls window (which you can hide or unhide by pressing the right mouse button while viewing an image) you can perform a number of useful image manipulation functions such as resizing, cropping, cut and paste, blurring, sharpening, edge detection and embossing.

If you specify multiple filenames on the command line, or use wildcards (such as `xv *.gif`), you can use the space bar and Backspace key to move between the images. For an automated slideshow, you can use the `-wait` command line option to wait a number of seconds, then move on to the next image; for example `-wait 5`. If you want XV to go back to the first image after it displays the last one, you can use the `-wloop` option, and to get XV to randomise the order in which it displays the images, use `-rand`.

XV also has a good selection of colour editing features, including colourmap editing for indexed images (such as GIF files), HSV (hue, saturation and value) modification, and RGB modification. With these features, you can do gamma corrections, brightness and contrast changes, and hue changes interactively.

The 'Visual Schnauzer' feature of XV lets you easily view and arrange your collection of images. Each image in a directory is displayed as a thumbnail, and you can move or copy files between directories by clicking and dragging.

To display an image on the background of your screen, you can use the `-root` flag of XV (in X terminology, the background is called the 'root window'). The `-quit` option is often used in conjunction with this so that the XV process doesn't stay around once it has loaded the picture (which will stay on the screen even if XV goes away). A command such as `xv picture.jpg -root -quit` could be placed in your X start-up file (`.Xclients`, `.Xsession`, or



`.xinitrc`) to load a particular picture as your background.

XV includes a program called `bggen` that can create smooth coloured gradients between two or more colours that can be displayed as your background. To use it, you need to send its output to XV ('`bggen`' only creates images, it can't display them). For example, the following command line will create a blue-to-green fade across your background:

```
bggen blue green | xv -root -quit -
```

Note the dash at the end of the command line — this tells XV to load an image from the output of the `bggen` program.

The man page of `bggen` (type `man bggen`) gives a number of other example backgrounds to try, including rainbows, tiles and diamonds.

The author of XV has licensed it as shareware for personal use (the standard registration fee is \$US25), but commercial, government and educational users are required to register.

Gimp

Gimp is a full-featured image editing tool. It has the regular set of painting tools such as Pencil, Paintbrush and Eraser, as well as a very large range of filters from the common (Blur and Edge Detect) to the unusual (Coffee Stain and Alien Map). Other noteworthy features are its support for layers, multiple undo and redo, animation support (including GIF animation), and its plug-in and scripting abilities.

Because of its scripting abilities, Gimp is exceptionally useful for creating Web graphics. For example, if you want to create a number of buttons with a consistent background but different text on each, you

could write a script which automatically produces these images. It will be more work initially, but you could easily save time if there were many images to create, or if you decide later that you should have used an 11-point font instead of a 12-point one.

For more information on Gimp, see the Gimp Web site at <http://www.gimp.org/> or the Linux column in APC January (page 114).

Netpbm

Netpbm is a collection of programs that can be run at the command line to convert between image formats and perform a number of basic image operations. Each of the programs is designed around the Unix philosophy of one program being designed to perform one simple job well, allowing multiple programs to be connected together to perform more complicated tasks.

There are about 60 different image formats that can be read or written using Netpbm tools. To avoid needing to have one program for each possible image conversion that can be done (well over 3,000 conversion programs would be needed in that case), there are common formats used by all of the programs, called PBM (for black-and-white bitmaps), PGM (for greyscale images), PPM (for full-colour image), and PNM (for any type of image).

This way, only about 120 conversion programs are needed, but a conversion from JPG to PNG, for example, would be done as a two-step process: first convert the JPG file to PPM, then convert the PPM file to PNG.



The following are two examples of image conversion.

To convert a GIF file called test.gif to a BMP file:

```
giftopnm test.gif | pmtobmp > test.bmp
```

Note the use of the `|` pipe symbol to send the output of the `giftopnm` command to the `pmtobmp` command, and the `>` redirection symbol to send the output of the `pmtobmp` command into a file.

To convert a JPG file to a GIF file:

```
djpeg test.jpg | ppmquant 256 | pmtogif > test.gif
```

This example is a bit more complicated because the GIF image format cannot use more than 256 colours, but the JPG format can use millions of colours. `ppmquant` reduces ('quantises') the number of colours to the amount you specify. If you select fewer than 256 colours, your GIF file will be smaller, but it may not look as good.

Strictly speaking, `cjpeg` (for creating a JPG file) and `djpeg` (for decompressing a JPG file) are not a part of the Netpbm tools, but they do use the common PNM formats.

The image operations that can be performed on PNM files include image scaling, smoothing, cropping, cutting and pasting, and gamma correction. For example, to resize a JPEG file to one-quarter of its original dimensions, convert to a 16-colour GIF, and display the result in XV, you could type:

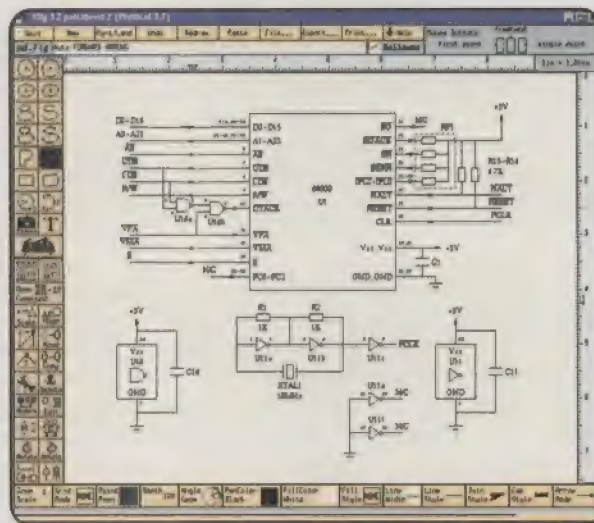
```
djpeg test.jpg | pnmscale -xscale 0.25 -yscale 0.25 | ppmquant 16 | xv -
```

After all this, you may be thinking that this seems like a hard way to do what could be done in a few clicks of the mouse. The biggest advantage of knowing how to do it on the command line is that the command line is programmable. For example, if you had 100 images from your recent holiday that you wanted to put on the Web, you might want to create thumbnail versions of the images so that people can decide whether they're interested in waiting for the full-size version of your image to download. To resize 100 images in XV would take quite a bit of mouse-clicking, but to do it on the command-line would

just involve a few lines of typing:

```
for filename in *.jpg; do
  imagename="basename $filename .jpg"
  djpeg $filename | pnmscale -xscale 0.1 -
  yscale 0.1 | cjpeg > $imagename-small.jpg
done
```

The first line tells the shell that we want to run some commands on every file in the current directory whose name ends in '.jpg'. The second line (note that the quotes are backquotes, not regular single quotes) sets a variable called `imagename`, based on the filename without the '.jpg' at the end. The third line decompresses the input JPG file, rescales, recompresses and outputs it to the original name with a '-small' suffix. The most important thing when using these programs is to be careful not to write to the same filename you are reading from,



because the input file will be overwritten before it is read, and you will need to get out your backups.

The above lines could also very easily be turned into a shell script so that if you ever wanted to create thumbnails again, all you would need to do is type 'createthumbnails', then sit back and watch while the computer does the hard work for you.

The next challenge in using the Netpbm tools is figuring out what command you should be using. For example, if you want to convert to a PCX file, is it `ppmtopcx` or `pnmtopcx`? The best way to find out is to use the `man` command with the `-k` switch (think 'k for keyword search'). For example, `man -k pcx` would show:

```
pcxtoppm (1) - convert a PCX file into a portable pixmap
```

```
ppmtopcx (1) - convert a portable pixmap into a PCX file
```

To find out more about any of these commands, you can type `man` followed by the name of the command.

XFIG

XFIG is a vector-based drawing tool (as opposed to programs such as XV and Gimp which are raster/pixel-based). This means that it is far more useful for illustrations or technical drawings than a raster-based tool, but it is not useful at all for, say, editing a photo, although you could insert an image into a figure and draw on top of it (for example, to add annotations).

XFIG lets you draw with lines, splines, circles, ellipses, boxes, arcs, polygons, and text (these are its basic objects). Line widths, line colours, fill colours and styles, arrowheads, and many other object attributes are supported. For precision drawing, there are grid and snap-to-grid features as well as a ruler which can be set to metric or imperial measurements.

Objects can be glued (grouped) together into one 'compound' object, so that they will all move, copy, or scale as a single unit. Compound objects can also be made part of a library; this is useful when drawing many diagrams that use the same sets of symbols. The XFIG distribution includes libraries with electronic schematic symbols, logic symbols, flow-chart symbols, music symbols, and more.

To learn how to use XFIG, there are a couple of useful documents included with it. The first is the HTML user manual; this will take you through all the functions and features of XFIG in detail. Another is the `xfig-howto` PDF document, which provides some hints on how to use the program effectively. These documents and the `man` pages should be available under the Help menu.

XFIG directly supports a number of export formats from its Export menu, including LaTeX (a Free typesetting system), EPS (Encapsulated Postscript), GIF, TIFF, and PPM. In conjunction with Ghostscript (a Free PostScript interpreter) and the Netpbm tools, you can indirectly export to nearly any image format in common use. ■

URLs

```
XV      http://www.trilon.com/xv/
Gimp    http://www.gimp.org/
XFIG    ftp://www-epb.lbl.gov/xfig/
```


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The first in a series on programming in C++ — core features and programming techniques. By Michael Smith

Simple C++

Simple C++ — the combination of those two words would seem to be an oxymoron. C++ is a rich and complex language and similarly, the average C++ tutorial is a rich and complex text, with particular emphasis on the *complex* bit. Yet it needn't be that way. Using a simple subset of the C++ language, it is possible to write useful and robust software. If necessary, you can then move on to explore the more esoteric corners of the language — but that can be done slowly or not at all. However, if we do not achieve a good grasp of the fundamentals, then confusion is probably inevitable.

This month's column is the first in a series in which we explore the core features of C++ and try to build a firm foundation in C++ programming techniques.

Who should read this?

This series will attempt to give you a thorough coverage of essential C++ skills. It

won't assume any C or C++ knowledge.

- If you are an absolute novice at computing, and are still struggling to find the Alt key, then this is probably above your head.
- If you're a competent computer user with no programming experience, you'll probably get quite a bit out of this series — though you may want to invest in a good dictionary of computer terms.
- If you've got a bit of programming experience and want to learn C++, then this series is definitely a good starting point.
- If you're a C guru and want to move into C++, then you may find the first few columns on 'tools and building blocks' a little boring, but the rest should be right up your alley.
- If you're already a C++ guru, you can forward corrections to me.

The plan of attack

C++ is an *object-oriented* language. As you would expect, much of this series will be about creating objects and working with

objects. However before we can work on C++ objects, we need to cover a little preliminary ground. With this in mind, the first few columns will concentrate on 'tools and building blocks', then we'll get into the meat of the language.

Trust me, I'm a doctor programmer

One of the greatest difficulties in writing about elementary programming is information overload. So many of the early topics are interdependent. To understand A you must use B, but to understand B you must use C and so on. In order to keep focused on a manageable quantity of information, I'm going to include some material in the early examples without explaining exactly how and why it works. At that point, I'm saying 'trust me, it works and I'll explain how later'.

So, with preliminaries out of the way, let's start on the C++ language.

Code portability

As with all programming languages, the inevitable question arises: will the code work on *my* computer with *my* compiler? Until fairly recently that question was particularly hairy for C++ programmers.

The American National Standards Institute (ANSI) and the International Standards Organisation (ISO) produce standards documents for programming languages. The two groups generally cooperate and, as is the case for the C++ standard, the ANSI and ISO standards are usually just about identical. The C language was standardised in 1988, and for some years now most compiler vendors have supported the ANSI/ISO C standards. Most compilers offer a vast array of extensions and 'improvements', but a programmer

who is concerned about portability can ignore these extensions and write 'standard' code. By doing this a programmer can be reasonably confident that their code will run on just about any platform. Unfortunately, the C++ standard has been much slower in coming. C++ is a much newer language than C and has been in wide use for much less time. C++ is also a much more complex language than C, so the standardisation process is inevitably much more complex.

The final version of the C++ standard was ratified in November 1997, but various draft versions have been available since 1995. Therefore it's reasonable to assume that recently released compilers would try to support the ANSI/ISO C++

standard. Older compilers may or may not do so.

For this series, we're going to try to stick closely to standard C++, so all the example code should (hopefully) run on any standard compiler. My plan is to test all the code on three popular compilers: Microsoft VC/C++ 6.0, Borland C++ Builder 3.0 and DJGPP (a DOS port of the GNU C++ compiler). Each of these claim to be ANSI/ISO compliant, so I'm hoping that we won't have too many portability problems.

If anybody has trouble running the example code on a compiler which claims to be ANSI/ISO compliant, drop me a note at workshop@acp.com.au and we'll try to resolve it.

Our first program

In 1978, Brian Kernighan and Dennis Ritchie introduced us to C with their first example program — which printed 'Hello World'. Since then, it has become standard to start programming tutorials with a similar example. If it's good enough for the esteemed Ritchie, it's good enough for me.

```

Hello.cpp
#include <iostream>

int main()
{
    std::cout << "Hello C++ Enthusiasts!\n";

    return 0;
}

```

I've called our first program `Hello.cpp`. Some people use extensions like `'cc'` or `'cxx'` for their C++ source files. It doesn't make any difference, as long as your compiler recognises the file as a C++ source file.

The first line of the program, `#include <iostream>`, tells the compiler to include the external file `iostream`. This contains information about standard stream I/O, needed for the rest of the program. We'll cover more about that later, but for now, put that in the 'trust me' category — you need that line in the program.

The statement `int main()` defines a function called `main`. A C++ program can have many functions, but it must always have a function called `main`. This is the start-point of the program. A function must always begin and end with curly brackets `{}`.

The operator `<<` ('put to') sends the data on its right to the stream on its left. In this case the data is a character string `Hello C++ Enthusiasts!\n`, and the stream `std::cout` is an output stream which is usually directed to the screen. Sending

the data to `std::cout` will generally result in the data being displayed on the screen. Take particular note of the last two characters in the string `\n`. In a string, the backslash (`\`) character followed by another character indicates a special character. In this case, `\n` indicates a newline character.

The `main()` function must always return an integer. In this case we are returning a value of zero. On DOS, Windows and Unix systems a return value of zero generally indicates that the program completed successfully and a non-zero value indicates an error condition.

Notice that each of the lines inside the function ends in a semicolon (`;`). All C++ statements must end in a semicolon.

After compiling and linking the program, we get an executable. On a Windows 95 system your results might look like the screen shown above.



`char answer = 'Y';` Notice the single quotes used for a character as opposed to the double quotes used for a string.

`char letter = 66;` Letter is assigned the ASCII value of 66 ('B').

`float pi = 3.142;` Floating point numbers can double.

`bignum = 1.23e23;` Use normal or exponential format for literals.

`unsigned u = 25;` This is an unsigned integer.

Elemental data types

C++ defines certain fundamental data types. Some of these are elemental, referring to a single data value. Some are compound, combining multiple values. An elemental data type might be, for example, a single integer or floating point value. A compound data type might be an array, or a complex number with real and imaginary components. Examples of some fundamental data types are shown in the table below left.

The types `int`, `short` and `long` are, by default, signed integers. They may be prefixed with `unsigned`. The type `char` may default to either signed or unsigned, depending on the compiler. It may be prefixed by either signed or unsigned.

Some typical declarations might look like the following:

`int i;` *i* is an integer, but its value is undefined.

`short j = 2;` *j* is a short integer, and is initialised.

Some fundamental C++ data types

<code>char</code>	A single character.
<code>bool</code>	A boolean (true or false) value.
<code>int</code>	An integer.
<code>short</code> (or <code>short int</code>)	A short integer.
<code>long</code> (or <code>long int</code>)	A long integer.
<code>float</code>	A real number
<code>double</code>	A double precision real number
<code>long double</code>	An extended precision real number

There's an additional catch when using integer literals. Numbers that begin with a zero, like `055`, are considered to be Octal (base eight). Numbers which are prefixed with a zero and an `x`, like `0x55`, are considered to be hexadecimal (base 16). There are times when this can be extremely useful, but it's a very common source of errors.

Here is a quick Decimal/Octal/Hexadecimal conversion table:

Dec	1	2	3	4	5	6	7	8
Oct	01	02	03	04	05	06	07	010
Hex	0x1	0x2	0x3	0x4	0x5	0x6	0x7	0x8
Dec	9	10	11	12	13	14	15	16
Oct	011	012	013	014	015	016	017	020
Hex	0x9	0xA	0xB	0xC	0xD	0xE	0xF	0x10

Well, that's all we've got space for this month. Next month we'll delve into the anatomy of a function, uncover some more details on the private life of data types, and maybe even get a glimpse into the seedy world of operators, unless we're kidnapped by aliens or shut down by the CIA. Stay tuned.■

We take time out from our introduction to Java with a two-part exposition of the language's application to client/server systems. By David Williams

Java

TCP/IP has established itself as the lingua franca of the networking world and the Java programming language is gaining great force. Combining these technologies can help you make your own client/server systems, and even preserve legacy code, but we'll start by looking at just what client/server systems are and how they work. We'll also touch on how Java can help.

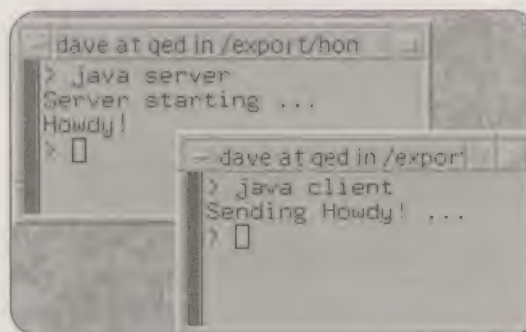
In 1982, the Internet consisted of several hundred computers at two dozen sites. By 1992, over 700,000 computers were attached to the Internet in 39 countries. This number was doubling every 10 months, and it is growing more rapidly today. Many large companies now have their own private TCP/IP network. In fact, much of computing has shifted into a distributed environment.

For example, a conventional database server stores information on the same machine as the application program that accesses it. A distributed version of such a database system permits users to access data from computers other than the one on which the data resides. If the distributed database application was well written, a user would not know whether the data being accessed was local or remote.

TCP/IP uses protocols to provide communication between machines on a network or on the Internet. For example, remote login, file transfer and electronic mail are all well-defined protocols. An example of remote login is the telnet protocol, which defines the format of the data sent between two machines, how data should be encoded and how special messages to control the session should be handled. For most people, the way telnet protocol works is irrelevant. Anyone can invoke software to access a remote machine without knowing or caring about the implementations.

A feature of TCP/IP is that it uses protocol port numbers to identify application services on a given machine. Software that implements a given service waits for requests at a predetermined and well-known protocol port. For example, HTTP — the World Wide Web — has been assigned port number 80, so when a user

invokes the HTTP protocol through a Web browser, by default it connects to port 80 on the specified machine. However, a protocol can use any port number — it is just that certain standards have been given. For example, a Web server could well be configured to use a different port number and browser programs would work just the same, except the port number would



need to be explicitly specified in the URL (for example, <http://www.somewhere.com:2000/>). The same applies for telnet and any other TCP/IP protocol. Typically, port numbers 1,023 and below are reserved for system use, and this is where FTP, telnet, HTTP and many other standard protocols lie.

TCP/IP, like most computer communication protocols, merely provides basic mechanisms used to transfer data. In particular, a programmer may establish communications between two application programs and pass data back and forth. This is known as peer-to-peer communication, and the peer applications can be executed on the same machine or on different machines. It is important to note that TCP/IP does not specify the details of how data passes between a pair of communicating applications. It does not dictate when or why peer applications interact, nor does it specify how programmers should organise such application programs in a distributed environment.

However, there is one organisational method which dominates the use of TCP/IP to such an extent that almost all applications use it, and this is known as the client/server paradigm. Indeed, client/server interaction has become so

fundamental in peer-to-peer networking systems that it forms the basis for most computer communication. As the name suggests, client/server programming involves the development of two communicating applications, a server and a client. The two differ in that the server will provide specific functionality and handles requests made by clients. To relate to the

World Wide Web, the browser is a client that requests Web pages and other documents from a remote machine. The requests are processed by an HTTP server running on the machine, which passes the requested information to the client. If a server is well designed, it will be able to respond to many concurrent requests from many different clients.

A major motivation for client/server programming is that TCP/IP does not provide any mechanisms to automatically create running programs when a message arrives at a particular port. Hence, a server must be waiting to accept communication before any requests arrive. Usually, a server will be automatically invoked during a machine's start-up sequence.

When writing client/server programs, you must choose between two types of interaction: connectionless or connection-oriented. These styles correspond with the two major transport protocols supplied by the TCP/IP suite, namely UDP and TCP respectively. This distinction is critical, because it determines the level of reliability that the underlying system provides.

TCP provides all of the reliability needed to communicate across the Internet or an intranet. It verifies the arrival of data and automatically retransmits packets that do not arrive. TCP computes a checksum over the data to guarantee that it is not corrupted during transmission. It uses sequence numbers to ensure that the data arrives in order, and automatically eliminates duplicate packets. It provides flow control to ensure that the sender does not transmit data faster than the receiver can consume it. It informs both the client and the server if the underlying network becomes inoperable.

UDP does nothing of the sort, however. When a client sends a request, it may be lost, duplicated, delayed or delivered out of sequence. The same is true for a response from the server. Note, though, that UDP does not introduce errors. It relies on the underlying network and its associated hardware, and in fact, UDP works well if the network works well, without the overhead imposed by TCP. Unfortunately this is usually only guaranteed in a small local area network.

Many people prefer to use the connection-oriented style of interaction (TCP). It makes programming simpler, and relieves the programmer of the responsibility of detecting and correcting errors. In fact, adding reliability to UDP is a non-trivial undertaking. Typically, UDP is only used if an application's protocols specifies it must, or if the application cannot tolerate the computational overhead or delay of TCP.

In the early 1980s, the US Government's Advanced Research Projects Agency (ARPA) funded a group at the University of California at Berkeley to transport TCP/IP software to Unix and make the resulting interface software available to others. They decided to use the existing system calls where possible, and to add new system calls to support TCP/IP functions where needed. The result is known as the socket interface.

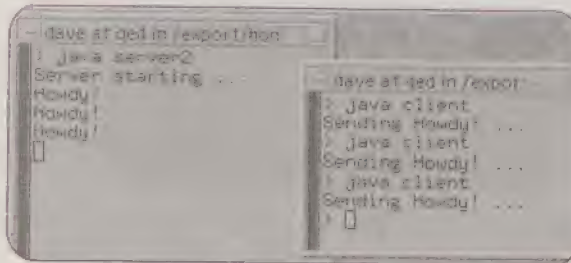
In most programming languages, an application that needs to perform I/O calls an open function to create a file descriptor, which is then used to access the file. File descriptors are typically an array of pointers to internal data structures, one set for each process running on the machine. The socket interface adds a new abstraction specifically for network communication, the socket. Like files, each socket is identified by a socket descriptor.

But this two-part series is really about client/server programming in Java, using TCP sockets. Java is an ideal language for client/server programming, as it is network-sensitive and architecturally neutral. I am sure more and more applications will be ported to Java, and that the client/server paradigm will be a key methodology in achieving this.

In my own experience, I had developed a command-line C++ artificial intelligence toolkit (see http://infosystems.newcastle.edu.au/maryanne/projects/CI_N.html). To improve ease of use and portability, a user interface has now been

written in Java but the real work of the program (a 'theorem prover') remains in C++, due to its complexity (not that Java cannot implement it, just that porting would be a significant endeavour).

Initially, native methods were used to join the two components together, but this solution was not terribly satisfying — particularly because it worked against the goal of platform independence. After a flash of inspiration, having taught a course on network programming, the client/server paradigm was applied. The user interface is now a Java client, and a



C++ server performs the real work. The two communicate via TCP/IP and are both standalone applications. The architecture neutrality has not been lost, and in fact, a C++ logic server has been developed. This provides realms of opportunities for distributed artificial-intelligence applications.

As a consequence, if the C++ portion is one day ported to Java, the client/server approach will most likely be retained, as it has not only proved useful in getting the toolkit to work, it has also had beneficial side effects and opened up worlds of possibilities.

That covers the theory and background behind client/server programming. Let us finish this month with something we can actually look at and run — although a lot of it still won't make sense. Two Java program listings follow. First, we have a simple server.

```
import java.net.ServerSocket;
import java.net.Socket;
import java.io.IOException;
import java.io.DataInputStream;
import java.lang.System;

public class server
{
    public static void main (String args[]) throws
    IOException
    {
        ServerSocket s = new ServerSocket (2000);
        Socket sock;
        DataInputStream datain;
```

```
System.out.println ("Server starting ...");
sock = s.accept ();
```

```
        datain = new DataInputStream (sock.get-
        InputStream ());
        System.out.println (datain.readLine ());

        sock.close ();
        s.close ();
    }
}
```

Next, we have a corresponding client.

```
import java.net.Socket;
import java.net.InetAddress;
import java.io.IOException;
import java.io.PrintStream;
import java.lang.System;

public class client
{
    public static void main (String args[]) throws
    IOException
    {
        Socket sock = new Socket (InetAddress.get-
        LocalHost (), 2000);
        PrintStream dataout;
        String Message = "Howdy!";

        System.out.println ("Sending " + Message
        + " ...");

        dataout = new PrintStream (sock.getOut-
        putStream ());
        dataout.println (Message);
        dataout.flush ();

        sock.close ();
    }
}
```

Both the client and the server should be compiled in the usual manner (via the JDK, through an IDE or however you normally choose to work). The server should be set running (a message will be displayed), and then the client. Once the client is started, a message will be sent to the server which will be displayed, and both programs will terminate. The server was run in one window, and the client in another.

The accompanying screen dump shows a sample run of the client and server programs. The message was sent from the client to the server, and displayed on the screen by the server.

Next month, we will look at just what the `java.net.Socket` and `java.net.ServerSocket` classes can do for us, and how the above code works. We then will enhance our server, and write code to call C from Java. ■

These shareware files can be found on **apcmag.cd**. Simply browse to the Workshop section to find the files and related reviews.

Shareware summary

Windows 98

Xara WebStyle 1.2

Easy-to-use design program with many options for creating attractive graphic elements for Web pages, including headings, buttons and backgrounds.

Tyler 3.1

Unusual program that turns an image into a mosaic of tiles constructed from selected picture files.

Ultimate Paint 1.9c

Powerful freeware paint program incorporating some unusual image transformations that can be highly customised.

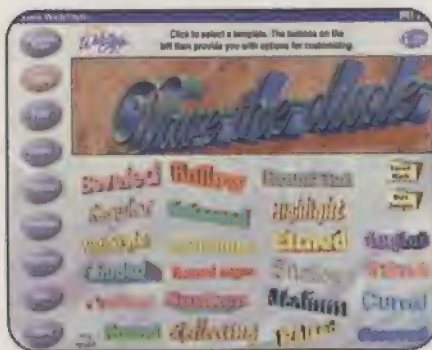
Repligator 4

An innovative image processor that allows rapid and easy testing of an interesting set of transformations.

Graphics Workshop

Professional 2.0a

Powerful image handling/management program with extensive viewing and file conversion capabilities.



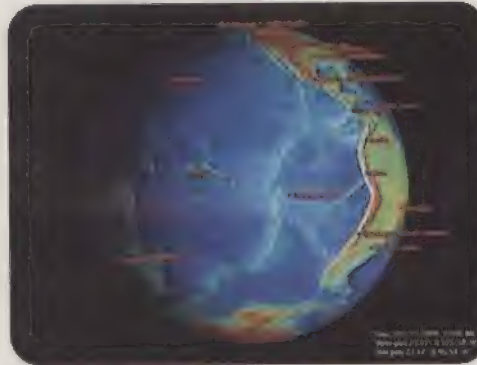
Tiera-Zon 2.7

Powerful fractal generator with many options, including numerous complex colour filters and images in 24-bit colour.

OS/2

Star Office 5.0

Star Office 5.0 from Star Division has taken the OS/2 world by storm! It is a fully integrated office suite, with versions for Java, Windows, Unix, OS/2, Mac OS and more. Star Office is the first really useful



and usable office suite for the OS/2 platform. It includes a fantastic word processor, spreadsheet, scheduler, database and presentation software . . . and that's just the beginning.

Mac OS

Transit

If your FTP needs are not too complex, Transit provides a Finder-style interface that makes light work of transferring files and manipulating remote files. A 'synchronise' command enables Webmasters to maintain a site with exemplary ease.

LinkPad

A notepad designed specifically for Web links, which can be dragged to the Pad for temporary storage, and later dragged to a browser window for instant connection. Dragging to a text file window reveals the actual URL.

Net-Print

Net-Print is a utility that enables you to save or print a selected passage of text, and that passage alone, from a Web page or other document. It can optionally record the URL, title and date of the source document.

PPPop

A PPP launcher and monitor which also provides session, daily or cumulative timing, as well as features which ease the process of switching between ISPs. PPPop can also be set to play sounds and perform defined actions, including AppleScripts on connection and/or disconnection.

Sigerson

This free, must-have Sherlock

enhancement allows you to specify sets of Sherlock plug-ins and to restrict searches to a specified set. Plug-ins can be installed, deleted, categorised and sorted, all from within the Sigerson window.

Linux

X-Chat

X-Chat is a relatively simple GTK-based IRC client with support for multiple channels and servers. Although it's still under development, it is user-friendly and has a good range of features.

gifsicle

A powerful command line GIF manipulation tool with extensive capabilities for working with animations. It is highly recommended.

gRun

gRun is a desktop application launcher similar in style and function to the 'Run' command in the Windows/NT Start menu. It can be configured to associate files with applications and it maintains a history of previous commands.

Wmtime

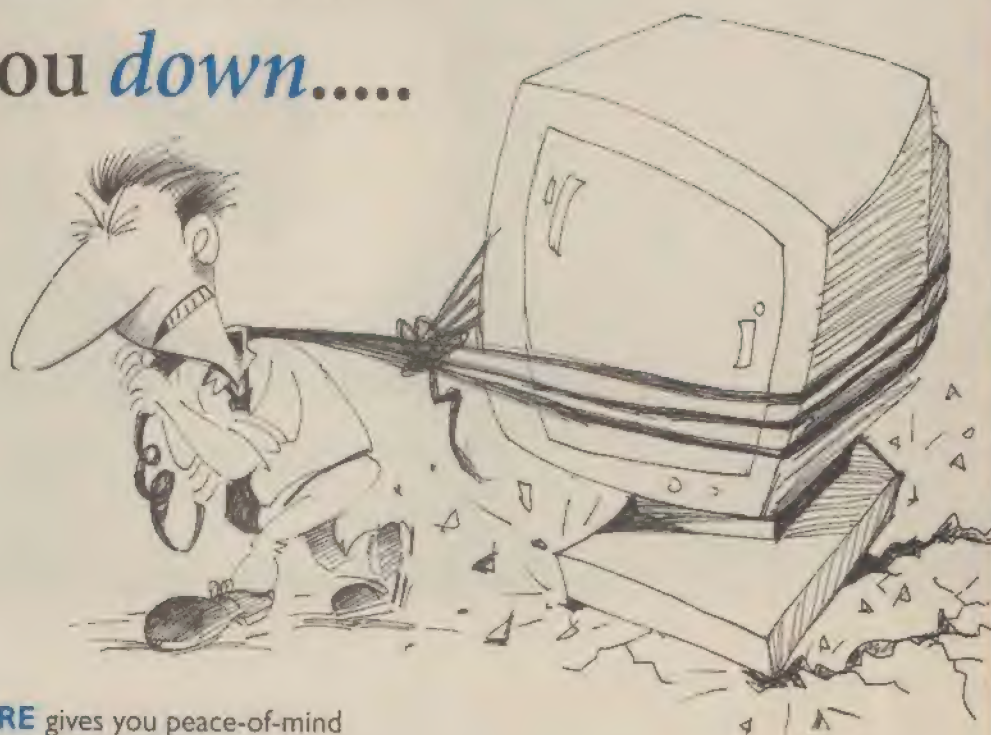
A time/date applet for window manager docks that displays 'Internet Time' as well as standard 12 or 24-hour clocks.

XGlobe

XGlobe places an animated view of the earth in the root window of your X display. This is similar to xearth, but allows for more detailed maps and offers improved support for KDE.



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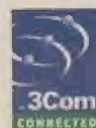
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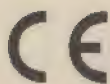
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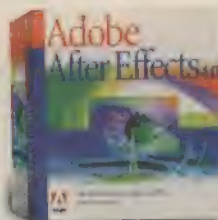
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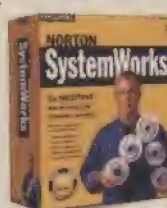
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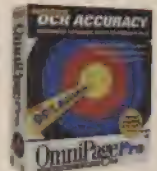
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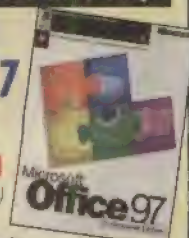
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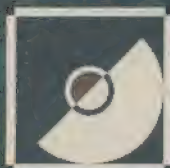
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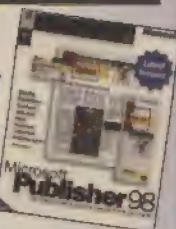
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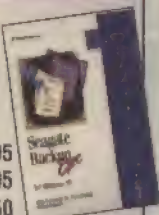


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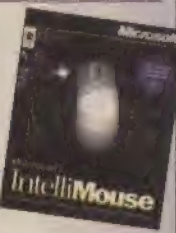
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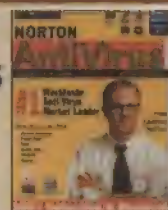


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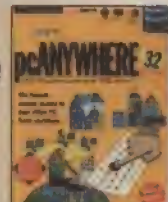
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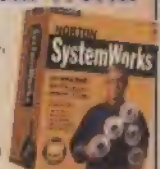
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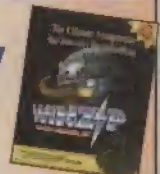
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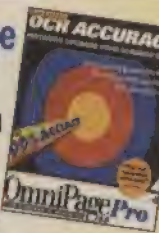
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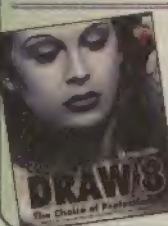
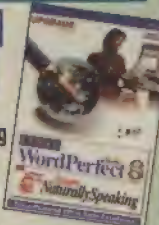
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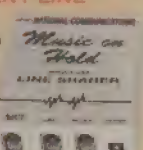
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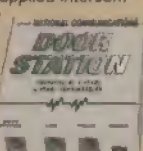
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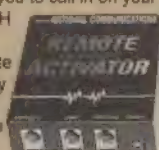
DOOR STATION FOR YOUR LINE

When a visitor presses a supplied intercom mounted at your front door or gate, your telephones will ring allowing you to answer and converse from any phone. If your line is in use, a 'Call Interrupt' facility will alert you. You can even open the gate or door with a command from your telephone.



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SHARE YOUR FAX OR MODEM LINE AND SAVE MONEY

Choose AUTO-CONNECT when you wish to fit a Modem or EFT-POS unit to your Fax line, to make outgoing calls.

OUTGOING MODEM or EFT-POS

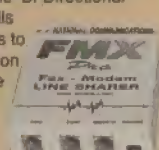
This low cost unit provides automatic connection to the telephone line on dialing. Other device is then locked out. Ideal for connection of Payphones, Modems and EFT-POS to any Fax, Commander, PABX or any type of Telephone line. Will also allow both a Fax and Fax/Modem to send and receive Faxes on your Fax line.



Choose FMX-Pro when you wish to fit a Modem to your Fax line and the Modem also needs to receive data calls.

AUTO MODEM RECEPTION

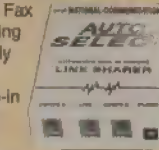
Now you can connect your Modem to your Fax Line for fully automatic Bi-Directional operation. Directs Fax calls to your Fax and Data calls to Modem. Barge-In protection is provided to prevent one device crashing in on the other while it is in use. Scanning facility will allow your Fax to be used as a Scanner for your PC.



Choose AUTO-SELECT when two or more Modems need to be connected to a Fax line or dedicated Modem line.

MULTIPLE MODEMS

The Auto Select devices will allow up to eight Modems to be fitted to ONE LINE, or seven Modems and one Fax on the same line. Incoming calls can be automatically routed to any of the 8 separate devices. Barge-in protection is provided to ensure that only one device can have access to the line at any one time.



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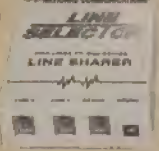
Interphone provides LOUD, CLEAR, telephone quality communication between any two ordinary telephones, which can be up to several kilometres apart. Simply lift the phone to ring the other. Operation is bi-directional. Ideal intercom for sheds or any remote location.



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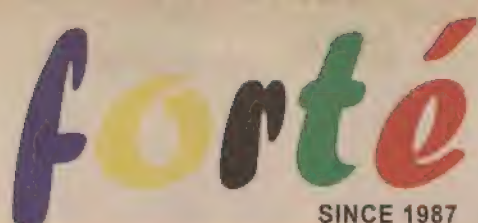
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HP LASERJET 6000N \$4570
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PANASONIC LASER KX-P6100 \$350
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3Com USB V90 voice message Plus \$280
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Open Systems Pty Ltd

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CANON BJC-4000/4100/4200/4550/5000/5500 BCI-21
CANON BJC-4000/4100/4200/4550/5000/5500 BC-20
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EPSON Stylus Colour /PRO/XL
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8.4/10G Quantum UDMA	388/468

3.5" SCSI Drive	
4.3/9.1G IBM LSW	541/1089
9.1G Quantum UW Bms	1219
9.1G Seagate Barracuda	1130
9.1G Seagate Cheetha	1774

SCSI Controller	
Fast SCSI PCI	80
Adeptec 2904 PCI OEM	122
Adeptec 2904 UW PCI OEM	343

CD-Writer / Removable Kite	
Compro Panasonic BR4W SCSI	644
Panasonic BR4W SCSI Bare Drv 522	
Compro Panasonic BR4W IDE	598
Rock MP7400 20x4x4 RW IDE 823	
Rock MP7400S 4x2x2 RW SCSI	81
Mitsubishi BR2W 8x2x2 IDE RW 581	
Kodak BR4WKits IDE	546

Floppy Disk Drive	
1.44Mb Mitsubishi Drv	40
120Mb Mitsubishi Drv Internal	155
LS-120Mb Drv External	255

Zap!uzer Drive	
100Mb Parallel Port	242
100Mb IDE Drive Int	171
1Gb Syquest Sparg IDE Int	489
2Gb SCSI Int / Ext	730
100Mb/1Gb(3 Pack) Cartridge 25/283	
2.0Gb Cartridge	211

Tape Back-Up	
Exabyte 4.4G TR-3 Ramovault	381
Exabyte 4.4G TR-3 Int	284
Exabyte Controller for TR-3	95
Exabyte 4.4G TR-4 Int	671
Verba TR-3 2.0G-4.4G Tape	60
Verba TR-4 4G Tape	60

Sony Dat 2G Int SCSI	1162
Sony Dat 4G Int SCSI	1492
External case for Sony	350
Sony 4mm 90M 2G Tape	73
Sony 4mm 120M 4G Tape	131
Wangdat 3100 2G SCSI Int	1122
Wangdat 3800 4-8G SCSI Int	1611
Wangdat 3900 12-24G SCSI Int 2284	
Wangdat 120M 4-8G Tape	195
External case for Wangdat drive 304	
Sony Cleaning Tape for DDS1	86

MultiTrack CD-ROM	
32 Creative INF4800	115
32 Panasonic / 24 SCSI	110/183
35 Mitsubishi	95
Yamaha 3D PCI SoundCard	40
Sound Blaster Live Value OEM	197
Sound Blaster AWE64 OEM	93
Sound Blaster 128 Bit PCI OEM 130	
Sound Blaster AWE64 Gold Rat 310	
Sound Blaster Live PCI Rat	407
Creative DVD Kit	487

Network Card & Hub	
NE2000 Compatible ISA/PCI	30/30
PCI 32bit 100 MBS	45
8/16/24 Port Hub	108/254/445

Video Card PCI/AGP	
2M / 4 M S3 Virge/DX PCI	44/60
4M S3 Virge/gx2 AGP TV out	75
8M Matrox Mystique G200 AGP	236
8M Matrox Millen II G200 AGP	187
Matrox Rainbow Studio M/G 572/582	
16M Matrox Video Capture AGP	559
12M APAC Voodoo II 3D Game	220
16M Creative Vision/Banshee AGP276	
8M Creative Voodoo II	310
16M Diamond 3D V550 AGP	351
16M Diamond 3D V550 PCI	376
6M Diamond Stealth II G460 AGP 166	
4M Diamond 3D V330 AGP	152
8M Diamond Fire GL1000 AGP	349
8 / 12M Diamond Monster II	305/344
16M Diamond Voodoo Banshee AGP 280	
16M Diamond Voodoo Banshee PCI 348	
512K EDO RAM 35ns	5

MotherBoard	
APEC Pentium ALI Chipset AT	137
ABIT BH6 Pentium II BX440 ATX 220	
Gigabyte GA586AX ATX	158
Gigabyte GA-6EA 440EX AT	174
Gigabyte GA-6BA 440BX AT	235
Gigabyte GA-6BXC ATX	229
Gigabyte GA-6BX5	448
Gigabyte GA-6BXDS	553

CPU	
Intel Celeron 300A/400A	158/385
IBM 233/266/300MX	114/125/160
Pentium II 350	452
Pentium II 400	754
Pentium II 450	1135
AMD K6 II 300/333MMX	153/218
AMD K6 II 350MMX	260

Memory	
1/4Mb 30 pin	7/31
8 / 16 / 32Mb 72p Std	37/91/183
8/16/32Mb Parity	42/103/204
8/16/32Mb EDO	34/73/143
32Mb SDRAM PC66	89
32Mb SDRAM PC100	96
64/128Mb SDRAM PC100	188/356

Monitor	
15" Hansol 500A/500M	317/376
15" Samsung Synmaster 500S	367
17" Hansol 701A/700P	810/725
15"/17" Samtron	323/593
15"/17" Minuteman	299/552
17" Samsung 700S/B/P 693/651/1133	
17" Goldstar 77 / 7D	814/812
15" Sony 100 ES	548
15" NEC V500	367
17" Sony 200ES/GS	963/1273
17" NEC V700/E700	759/1122
17" Sony 200 PS	1676
19" Sony 400 PS	2013
21" Samsung 1000S	2370
21" NEC 1100/P1150	2370/3287

Printer	
Epson LX300/LQ300	241/373
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Epson Stylus Photo Ex	767
Epson 1520/3000 A2 Size/1801/3283	
HP 670C	255
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HP 690C	787
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HP 1600CM	3432

Scanner	
HP 4100/5100/6200C	345/481/767
HP 6250C / Photo Shop	971/858
Canon FB320 / FB620	211/272
Canon CS300/CS600	390/697
Artix 1236P/AT6/AT12	150/200/316

Printer	
Epson LX300/LQ300	241/373
Epson LQ570/LQ870	598/897
Epson LQ2070	830
Stylus 440/640/700	251/319/428
Stylus 740/850	511/752
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Mitsubishi 56K V90 Voice Ext	140
Netcom 56K Roadster II Retail	288
Netcom 56K Roadster II OEM	206
Xoom 56K with Ethernet RJ45	525
Dynalink 56K Voice Int	151
Dynalink 56K Voice Ext	163
Xoom 56K PCMCIA Ethernet	608
US Robotics Sportster 56K	221
Netcom 56K PCMCIA & RJ45	365

Printer	
Banksia SP 56K OEM	204
Banksia SP 56K Retail	237
Xoom 56K PCMCIA	294
Mitsubishi 56K V90 Voice Int	105
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Xoom 56K PCMCIA Ethernet	608
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Dynalink 56K Voice Ext	163
Xoom 56K PCMCIA Ethernet	608
US Robotics Sportster 56K	221
Netcom 56K PCMCIA & RJ45	365

Printer	
Banksia SP 56K OEM	204
Banksia SP 56K Retail	237
Xoom 56K PCMCIA	294
Mitsubishi 56K V90 Voice Int	105
Mitsubishi 56K V90 Voice Ext	140
Netcom 56K Roadster II Retail	288
Netcom 56K Roadster II OEM	206
Xoom 56K with Ethernet RJ45	525
Dynalink 56K Voice Int	151
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333MHz \$899	Pentium II celeron 128k \$300	AMD K6-II 3D CPU +	ASUS BX \$299	S3 Savage 8m \$149	Acer 19" \$1399
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Pentium II Celeron	300\$1899 333\$1949	350 \$349 400 \$479	Gigabyte BXE \$249	Aopen 8m SiSagp \$99	LG17" 77i.28 \$599
300A \$849	350\$1999 400\$2049	Pentium II celeron \$	Gigabyte BX with UAW	Aopen 8m Intel \$109	Mitsubishi
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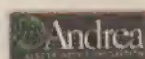
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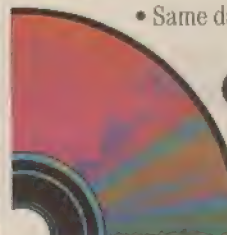
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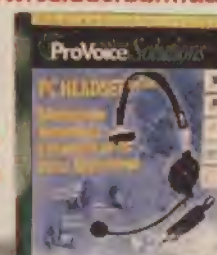
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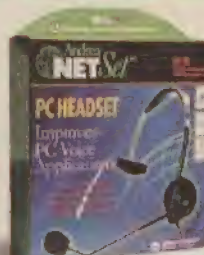
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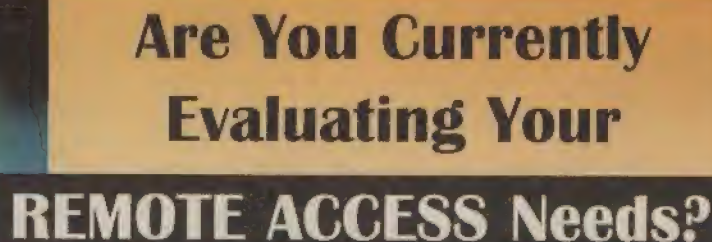
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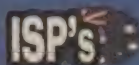
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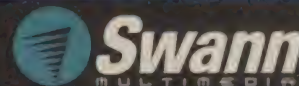
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5 RSL Mobile Phones

6 Processor

7 Western Digital

8 Gigabyte, Citizen

9 Chaintech

10 Diamond Multimedia

11 Eagle, Wincast

12 Creative Multimedia

13 Panasonic Drives, PowerQuest

14 Umax Scanners, Spirit

15 Netcomm/USR

16 Mitsubishi

17 Panasonic Monitors, Videcom

18 Ricoh

19 Sony Mavica, HP CDRW

20 Iomega

21 Teac

22 Altec Lansing

23 D-Link

24 Internet Software, Moore Music

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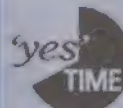
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RAGEN009	64MB PC-100 SDRAM	\$185
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Code	Model	Price
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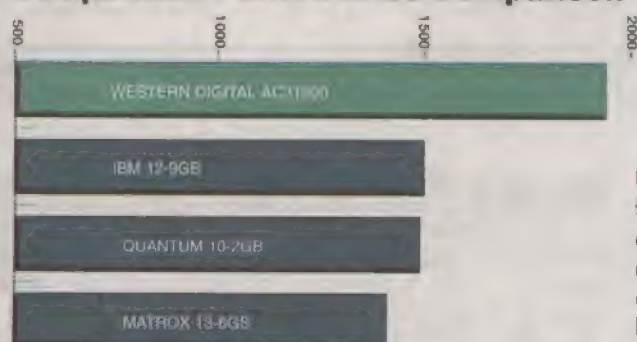
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HDWES004	AC28400	8.4GB	66Mb/s	\$365
HDWES005	AC310200	10.2GB	66Mb/s	\$445
HDWES006	AC313000	13.1GB	66Mb/s	\$575

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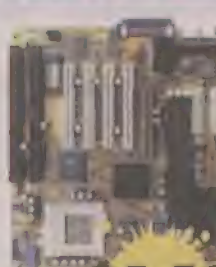
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HDQTM038	Fireball EL	12.7	512KB	UDMA	5400	\$675

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HDIBM010	DDRS 34560-68.4.5	4.5	512KB	U/W	7200	\$585
HDIBM011	DDRS 39130-50.9.1	9.1	512KB	Ultra	7200	\$1025
HDIBM012	DDRS 39130-68.9.1	9.1	512KB	U/W	7200	\$1025

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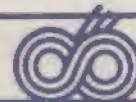


iDP 3540

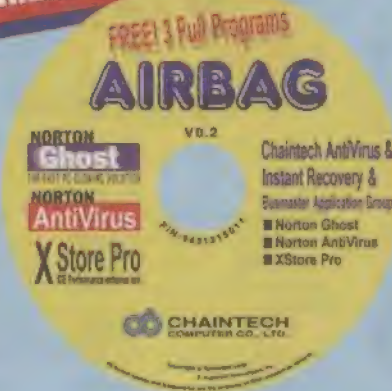
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- 3 lines per second
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PRCIT001



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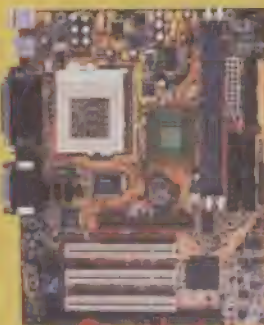
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- 2 x Ultra DMA33 IDE Ports, 1x Parallel, 2 x Serial, ATX Form
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- 2 x 168PIN DIMM Slots up to 256MB SDRAM
- 1 x AGPx2, 3 x PCI, 1 x ISA expansion slots
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CT-6AIA Celeron Mainboard



\$185

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- ESS Solo1 PCI SoundCard
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AGP OEM

DCDIA020

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DCDIA017 **\$309**

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- 9.6 audio systems
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- Advanced 320-voice wavetable with support for downloadable samples
- Supports DOS and Windows games

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Rio PMP300

Internet Music in the Palm of Your Hand!

The first portable MP3 music player that stores up to 60 minutes of digital quality sound. Load the latest songs on to Rio directly from your Hard Drive, personal CD's or the Internet and carry them with you. It's smaller than an audio cassette and has no moving parts, so it never skips. Powered by a single AA battery, Rio provides up to 12 hours of continuous music playback.

- Lightweight - only 70 grams
- Palm size for easy portability
- 32MB built-in flash memory

\$459

MMDIA012



Micronics C400

The Ultimate Multimedia Platform



Diamond's Micronics C400 motherboard is the perfect platform for your ultimate multimedia system. Featuring Intel's 440BX AGPset, it supports Pentium II and Celeron processor up to 450MHz, Ultra DMA/33, USB, IR communications and advanced system monitoring features. For your totally accelerated PC, start with the best!

\$269

M8DIA000

- 5 PCI slots (1 shared)
- Award BIOS on 1MB flash
- Legendary Micronics quality and performance

HomeFree

Easy Wireless Networking!



No holes! No cables! HomeFree delivers 1MB wireless links for up to 16 PCs, 45 metres apart. Includes point-and-click network setup, software for shared Internet access, all at an incredible price. Windows 95/98 only.

Desktop to Desktop

\$439

NWDIA000

Desktop to Notebook

\$509

NWDIA001

- Frequency hopping for maximum security
- 45-metre range
- Each kit contains 2 nodes

Video & Sound Cards



EAGLE

EAGLE VOODOO II PCI GRAPHICS CARD

...for FOR THE ULTIMATE 2D/3D GAME EXPERIENCE!

- Features:**
- 12MB of high performance EDO RAM
 - Based on 3Dfx Voodoo2 chipset with dual texture engines
 - Full Direct3D hardware acceleration and compatible with 3Dfx Glide titles
 - SLI(Scan Line Interleave) connector and SVGA loopback cable included
 - Support any 2D graphics system through a video passthrough connector

12MB

\$225
DCEAG004



EAGLE i740 AGP VGA CARD

FOR BLISTERING PERFORMANCE AT AN AFFORDABLE PRICE!

- Features:**
- Using Intel 740 High Performance chipset
 - Full AGP 1.0 compliant and Full feature AGP 2x Implement
 - 3D Graphics Enhancements:
 - Support High-Quality MPEG1 and MPEG2 playback
 - Supports DirectX and OpenGL

DCEAG005 **\$85**



S3 Trio3D AGP VGA CARD

...for 3D graphic enhancement!

- Features:**
- Using S3 86C365 3D High Performance Chipset
 - High performance 3D graphics engine.
 - Drivers for all major operating systems

4MB

DCEAG006

\$55



4MB 3D FX Voodoo 3D Accelerator **\$145**
2MB S2 Virge 3D PCI VGA Card **\$49**

4MB S2 Virge 3D PCI VGA Card **\$53**
ES1938 (SOLO-II) PCI Sound Card **\$39**

WinCast TV Tuner

WinCast/TV

PCI-BUS TV, IMAGE CAPTURE AND INTERCAST DATA RECEPTION!

WinCast/TV is a single slot PCI card which has a 125-channel cable-ready TV tuner and a video digitizer.



With WinCast/TV you can:

- watch TV on your VGA screen in a resizable window
- input from your VCR or Cam Corder
- snap still video images
- grab motion video movies
- videos conference with PC video conferencing software like NetMeeting, CU-SeeMe, IPhone, VDOphone and more!

**Plug-and-Play
Installation**

WinCast/TV's motion video capture will make digital video movies on your PC's hard disk.

Capture professional quality 24-bit video images with 4:2:2 digitizing.

Live TV-in-a-window on VGA monitors from 640x480 to 1280x1024 in up to 16 million colours.

Create high impact presentations with 320x240 AVI clip capture with real time preview.

\$265

MMHAU000

Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday
Technical Support (5 Days a week 9am-6pm) Phone (02) 8344-3160

Sales Hotline 02 8344 3160

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Please note our Terms and Conditions



Creative Multimedia

PC-DVD Encore 5X with Dxr2 technology



Creative® PC-DVD™ Encore 5X brings affordable third-generation DVD-ROM technology to your PC. Dolby® Digital (AC-3®) 5.1-channel* audio, 32X maximum CD-ROM speeds, and Dxr™2 picture enhancement technology provides an exciting way to watch DVD movies... and run CD programs.

Connect the Dxr™2 board to your TV and watch DVD movies from the comfort of your family room. Play thousands of Video CD Titles as well. Blazing 32x Speed CD-ROM Drive, 3rd-Generation DVD-ROM drive moves data at 5X speed Access up to 17GB of data and transfer DVD-ROM data at up to 6,760KB/second.

\$565
MMCRE034

Sound Blaster Live! Value



\$265
MMCRE031

Interested in a powerful audio/gaming experience?

Listen to game and music content come alive using the analog four-speaker output - even if your sound source doesn't support 3D sound! The Sound Blaster Live! Value utilizes the

same EMU10K1 audio processor as the Sound Blaster Live!, the most powerful audio chip available today. This translates into higher frame rates in your games, more bandwidth for 3D audio and an all around fantastic sounding audio experience.

For music playback, the EMU10K1 includes a powerful SoundFont® based synthesis engine with an astounding 512-voices of wave-table sound and has access to up to 48 MIDI channels simultaneously.

Creative's patented technology provides near-perfect Sound Blaster emulation. This means that it works with the existing base of MS-DOS® and Windows® titles at up to Sound Blaster 16 functionality. Then add realtime Environmental effects to a title, even if it doesn't support 3D audio.

Graphics Blaster RIVA TNT



Delivers world-class 2D and 3D acceleration using nVidia's new RivaTNT processor Ultra-wide, high-speed 128-bit memory architecture and Twin-Texel 3D pipeline deliver mind-numbing speed in virtually any application. Loaded with 16MB of Synchronous Memory and a powerful

250MHz DAC for incredibly high resolutions and refresh rates with brilliant, vivid color. Available for PCI 2.1 or AGP 2X (with sideband support) slots. The perfect platform for the power user, gamer or graphics designer.

\$385
MMCRE035

\$385
MMCRE036

PC Works Four Point Surround

\$269
MMCRE033



Experience the new standard for multi-channel audio with a four-speaker surround system. With four compact amplified satellite speakers, separate subwoofer, two rear stands and the single master volume control, PC Works™ FourPointSurround is the first complete four-

channel speaker system for the PC.

Designed with the same technology as the award-winning PCWorks, the PCWorks FourPointSurround sound system delivers superb upper band response, with crystal-clear highs and great midrange for total home stereo quality. Now you can experience truly immersive 3D audio with four independent speakers.

- Four compact 2.75" cube satellite speakers with two surround speaker stands based on the critically acclaimed PCWorks design
- Powered subwoofer with bass level control and contoured amplification.

Screaming Performance at a Killer Price!



A complete 2D/3D graphics solution based on the new Voodoo Banshee™ chipset from 3Dfx Interactive®. Features a full 128-bit graphics core and the same 3D rendering technology used in the award-winning Voodoo2. 16MB of high-speed synchronous memory and a 250MHz DAC deliver awe-inspiring resolutions, rock-solid refresh rates, and stunning visual quality.

\$275
MMCRE029

\$275
MMCRE030

Panasonic Drives



Adelong Computers

LS 120 120MB LKM-F434-1

- Large storage cap. of 120MB in a single LS-120 diskette
- 100% compat. with existing 3.5" diskette media
- Bootable with BIOS



BUPAN000 **\$169**

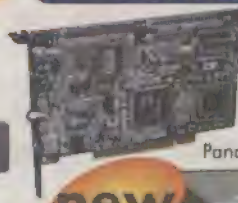
ZIP Drive JU-811T01

- 100Mb Capacity (70 FDDs)
- Use with 100MB Zip Disk
- IOE Interface



BUPAN001 **\$165**

Panasonic DVD Kit



DVD technology brings a whopping 8 GB of data per disk to your desktop today. Watch the latest DVD titles or play the latest multimedia and games with the

Panasonic DVD kit.

new



MMPAN006 **\$355** (DVD Drive & MPEG Decoder)

MMPAN005 **\$275** (DVD DRIVE)

CD ROMS

Code	Model	Price
MMPAN002	CD ROM 32X CR-588-B	\$110
MMPAN001	CD ROM SCSI 24X CR-508-BPA	\$169

CD Recordable (4Wx8R)

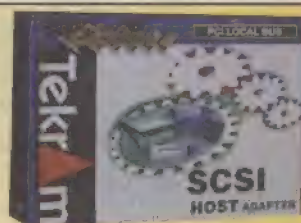
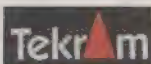
PRICE DROP

CD-Recordable Drive Kit, 4-speed write/ 8-speed read bundles with software & SCSI interface



MMPAN003 **\$675** (OEM KIT)

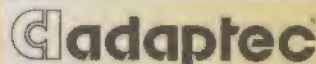
MMPAN004 **\$525** (BARE DRIVE)



Tekram
Code
CCGEN019

Model
Tekram PCI Ultra SCSI Card

Price
\$95



ADAPTEC DESKTOP SCSI

Code	Model	Tfr Rate Mb/s	Price
CCGEN001	AHA-1520	10	\$155
CCGEN005	AHA-2940UW	40	\$375
CCGEN006	AHA-2940UWK	40	\$585
CCGEN011	AHA1460 Slim SCSI PCMCIA	20	\$375



PowerQuest

DriveCopy

Fortunately, now there's DriveCopy from PowerQuest. With a few simple steps,

everything from your old hard drive is automatically copied to your new one without losing a single preference, setting, or byte of data. No re-installing, no data loss, no headaches. DriveCopy supports all of the popular operating systems and file systems they use.



SWPOW003 **\$49**

Drive Image

Easy - A user-friendly interface makes it easy to manage your saved files. And a step-by-step wizard simplifies the backup process.

Fast - Drive Image can now create a compressed image of your hard drive up to eight times faster than before. Plus, with its patent-pending SmartSector™ technology, Drive Image can copy significantly faster than traditional backup methods.

Safe - Drive Image now features ImageShield™ password protection and encryption to protect critical information.

Flexible - You can quickly restore your whole hard drive or recover individually selected files. Drive Image also allows you to "span" across removable media, such as Zip, JAZ, and SyQuest drives.



SWPOW002 **\$109**

PartitionMagic

With PowerQuest's PartitionMagic 4.0, optimizing a hard drive without destroying data is as easy as clicking your mouse. Now even the novice computer users can visually create, format, shrink, expand and move hard disk

partitions in minutes. NEW PQ Boot utility allows booting multiple OSs. Maintain system integrity by running different operating systems in different partitions. Recover up to hundreds of megabytes of hard disk space by resizing inefficient FAT clusters. Version 4.0 supports all major platforms, including DOS, Windows 3.1, Windows 95 NT, and OS/2.

- Intuitive Graphical User Interface.
- Shrink, expand and move FAT and HPFS partitions with the click of a mouse.
- NEW extensive file system diagnostics.



new

SWPOW001 **\$109**

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Umax Scanners

Astra 1220 series - Includes Adobe PhotoDeluxe

The Affordable 36 bit professional scanning solution

The Astra 1220 series was designed specifically for corporate or small office users who want something more from their scanner. Built with a 36 bit colour CCD, the Astra 1220 captures an amazing 68.7 billion colours to bring all your images to life. A complete range of easy to use software is included with the 1220, making it a versatile tool for any user. Perform OCR with astonishing accuracy or scan images to add a splash of colour to your documents. The opportunities are endless with the UMAX Astra 1220.

- 1200 x 600dpi optical resolution for crisp, vibrant images
- 9600dpi max. resolution for smooth lineart & image magnification
- A 36 bit colour depth captures 68.7 billion colours
- A4 scanning area (216 x 297mm)
- Single pass colour CCD for fast, productive scanning

1220S **\$495** SCSI IQUMA005

1220U **\$345** USB iMac compatible IQUMA006

1220P **\$279** PARALLEL IQUMA000

Astra 610 series

The compact plug 'n' play colour scanner for home and office users

Add the colour and vitality of images to everything you do on your computer with a new Astra 610 series scanner. After plugging it in and installing the software, simply press the 'on' button at the front of the scanner and you're ready to go - it's that easy!

- 600 x 300dpi optical resolution for crisp, vibrant images
- 4800dpi max. resolution for smooth lineart & image magnification
- Captures over 1 billion colours through 30 bit scanning

- A4 scanning area (216 x 297mm)
- Single pass colour CCD for fast, productive scanning
- Extensive software package handles all your creative and scanning needs

610P **\$145** PARALLEL IQUMA002

610S **\$279** SCSI IQUMA003

SCSI Interface Included

SPiRiT

PCMCIA



Spirit Scorpion 56 FMSP1009 **\$249**

The Spirit Scorpion 56 fax/modem PC Card offers the features of a desktop fax/modem in a small "credit-card" size. Both KFlex and V90. Ready, the Scorpion 56 is a breeze to install and comes supplied with a full complement of software. This PC Card enables the mobile professional to exchange data faster using a range of notebooks/palmtops running Win 3.1x/95/98/NT/CE.

PCMCIA Ethernet Adaptor NWSIP000 **\$149**

MODEMS

NEW MODEL

SPiRiT 560SP

Spirit 560SP External 56,000bps FMSP1007 **\$165**

Internet Voice fax/modem with Speakerphone - SVD external 56k high speed fax/modem that supports the Rockwell K56Flex standard and popular data & fax standards up to 33,600bps. Hardware based error correction & data compression. Includes Windows fax and communications software with voice mail system, plus Windows Internet software.

All Modems include:
• 9/25 serial cable and Power supply (ext. model)

- Phone cord (all models)
- Installation instructions & documentation
- Software: Internet dialler & browser, data terminal emulation software, send receive fax application and voice mail system

560ISP Internal 56K Model
\$169



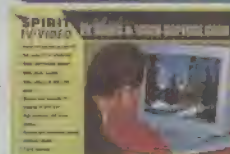
Code
FMSP1006

Description
Internal 56K modem, SVD.

Price
\$135

Spirit Ranger 56K
\$99 FMSP1008
SPECIAL PRICE with any Adelong System.
Call for details.

Multimedia



\$145
MMSP1000

Spirit TV Video Card

Turn your PC into a TV. PCI card that brings full TV reception capabilities to your PC. Features full motion video and "still" capture.

Networking

Spirit networking includes a full complement of NICs and Hubs in 10, 100 and 10/100 configurations.



5 Port Hub HWSIP005 **\$99**
PCI Network Cards HWSIP002 **\$55**
ISA Network Card HWSIP001 **\$39**
10/100 PCI NIC HWSIP003 **\$125**

Z3COM US Robotics Modem

56K Voice Message Modems

Now your business or home office can have more productive conference calls with the clarity and convenience of a top-quality full-duplex speakerphone - in the same device that brings the full power of the Internet into your desktop computer at amazing speeds.

With the V.90 56K Voice Faxmodem and your ordinary analog phone line, you can click through more Web pages in less time. Check out the latest weather maps, hear live audio broadcasts, even see video clips with connect speeds up to 80% faster than with other 28.8 modems.

Enhanced Features:

- Full Duplex Speakerphone
- Stores voice and fax messages even when your PC is switched off
- Make up to 100 documents available to callers with Fax-on-demand
- Remote retrieval of messages through single/multiply mailboxes
- Lifetime Limited Warranty

STANDARD
\$269
FMROB011



PROFESSIONAL
\$295
FMROB012

Professional Modem includes the following extra features:

- Caller ID
- One button access to voice mail
- Independent Fax Forwarding. Enables the modem to forward receiving faxes to a pre-specified number

3COM Megahertz 56K Global Fax/Modem

- Enjoy high-speed downloads up to 56 Kbps with the V.90 & x2 56K standard
- Simply select a flag or country name to instantly configure your global modem PC Card for use worldwide
- Switch PC Cards without rebooting or exiting Windows
- Intelligent Auto Install
- Compatible with all notebooks that comply with the PC Card (PCMCIA) standard



\$295
FMROB009

3COM Megahertz 10/100 LAN x 56K Modem

- Enjoy high-speed downloads up to 56 Kbps with the V.90 & x2 56K standard
- Simply select a flag or country name to instantly configure your global modem PC Card for use worldwide
- Switch PC Cards without rebooting or exiting Windows
- Intelligent Auto Install
- Compatible with all notebooks that comply with the PC Card (PCMCIA) standard



\$419
FMROB013

• HEADSET INCLUDED
• FREE COPY OF SYMANTEC WINFAX V8.0



Netcomm Roadstar II Ultra 56K

The Roadstar II 56 Ultra SVD is a voice/data/fax modem which lets you transmit and receive faxes and data directly from your desktop. It comes bundled with industry leading software enabling you to get started in minutes and of course its speed of 56Kbps makes the Roadstar II 56 Ultra SVD very fast. In short, the Roadstar II 56 Ultra SVD is a great value package to suit the online gamers, the small office user and the Internet power user. Its ease of use also makes it ideal for the first time user. The USB version goes further eliminating the need for the a power supply.

FMNET015 **\$259** SERIAL

FMNET015 **\$275**



Netcomm Card Modem 56K Global GSM



Gives the world traveller the freedom of data connection either through a land line or mobile phone (GSM), with data download speeds of up to a scorching 56,000bps as well as the ability to send and receive faxes of up to 14,400bps. Winfax included

\$349
FMNET017

WIRELESS COMPATIBILITY

Netcom CardModem
56K + Ethernet

\$309
FMNET008

Banksia Wave SP



The Wave SP 56 supports both V.90 and K56flex standards to ensure you have no disruptions to your 56K modem connections. A smart answerphone facility provides multiple mailboxes for up to 9 people. Voicemail messages can also be accessed remotely so you don't have to be in the office to receive your faxes.

- SVD Technology
- Full Duplex Speakerphone allows you to use your PC just like a telephone

\$235
FMBAN003

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EXCELLENCE THROUGH INNOVATION

Mitsubishi

3 YEAR ON SITE WARRANTY*

Mitsubishi Diamond View 1554 15"

- Advanced Plug & Play
- Superior image fidelity 0.28 Dot Pitch
- 13.6" True viewabl
- Maximum Resolution 1024x768 up to 65Hz

\$325 MOMIT003



Mitsubishi Diamond View 1772E 17"

- Advanced PnP compatibility
- Superior image fidelity 0.27Dot Pitch
- 15.9" True Viewable
- Maximum Resolution: 1280x1024 up to 60Hz

\$595 MOMIT002



Mitsubishi Diamond Plus 71 17"

- DIAMONDTRON Monitor, with the super-fine aperture grille pitch of 0.25mm Dot Pitch
- 16.0" True viewable
- Maximum Resolution 1280x1024 up to 65Hz

\$875 MOMIT001

pc world
BEST BUY

PRICE DROP



Diamond View 1995 19"

- High contrast 19" picture tube with 18" viewable.
- Flicker free high-resolution images 1600 x 1200 pixels at 75 Hz refresh rate.
- 5 user selectable and adjustable colour temperatures.

\$1295 MOMIT005



Diamond View 2107 21"

\$2095 MOMIT006

- 0.26mm Dot Pitch
- 20" Viewable High Contrast Flat Screen
- Max Resolution 1600 x 1200 at 80Hz
- OSD Contast, 15 pin & BNC output
- Excellent Choice for CAD, Design and multimedia applications

VALUE

Storage

The new standard in diskette storage.

Code Model
BUJMIT000 Mitsubishi LS - 120 - 120MB Capacity.

Mitsubishi LS-120 FACTS:

- Large storage capacity of 120MB in a single LS-120 diskette.
- 100% compatibility with existing 3.5" diskette media
- Supported by MS DOS, Windows (3X, 95, NT)
- Bootable, can act as a Boot Drive when appropriate BIOS installed

BUJMIT001 120MB capacity diskettes to suit LS - 120 Drive **\$25**

Code Model Price
FDMIT000 Mitsubishi Diamond Data 1.44MB Floppy disk drive. **\$36**

Code Model new Price
MMMMIT003 Mitsubishi Diamond Data 36X CD-ROM **\$95**
MMMMIT001 Mitsubishi Diamond Data 40X CD-ROM **\$105**



40x

Mitsubishi 15" LCD TFT

\$2049

MOMIT004

15" LCD TFT Monitor with the grille pitch of 0.28mm

Maximum Resolution 1024x768

PRICE DROP



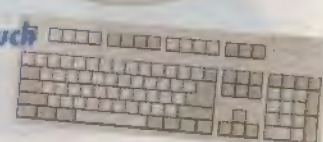
Keyboards

Mitsubishi Diamond Touch Ergonomic Keyboard

\$49 IOMIT001

Mitsubishi Diamond Touch Economical Keyboard

\$30 IOMIT000



Panasonic Monitors

Panasonic

Panasonic's NEW Digital technology sets the standards for Top performing high-end monitors. All monitors feature true-type colours, excellent focus and convergence, power saving functions and crystal clarity in colour display.

PanaFlat LC50

15" colour monitor with state-of-the-art design creating a slim profile.

Specifications

- 15" flat screen monitor
- 0.297mm dot pitch
- Built in Multimedia Speakers
- On-Screen display controls
- 1024x768 max.res.
- 15" viewable area

\$2375 MOPAN013



PanaSync™ E50i

Excellent Value Multi-Scan Display with Higher Picture Quality and Convenience.

Specifications

- 15" diagonal flat screen
- 0.28mm dot pitch
- Anti-static, Anti-glare coating
- 1024x768 max.res.
- 14" viewable area

\$360 MOPAN008



PanaSync SL70

17" Digital Multiscan colour FST display. The monitor that's very sharp and compact in size.

Specifications

- 17" flat screen monitor
- 0.27mm dot pitch
- Advanced anti-glare, anti-static coating
- On-Screen display controls
- 1280x1024 at 65Hz
- 16" viewable area

\$795 MOPAN003



PanaSync E70

Energy-Saving 17" Display with Automatic frequency selection from 30K - 70kHz.

Specifications

- 17" flat screen monitor
- 0.27mm dot pitch
- Anti-glare, anti-static coating
- On-Screen display controls
- 1280x1024 max.res.
- 16" viewable area

\$659 MOPAN010



PanaSync SL90

19" monitor with a large 18" true viewable area. Super sharp and compact in size.

Specifications

- 19" flat screen monitor
- 0.25mm dot pitch
- Advanced anti-glare, anti-static coating
- On-Screen display controls
- 1600x1200 max.res. at 75Hz
- 18" viewable area

\$1445 MOPAN011



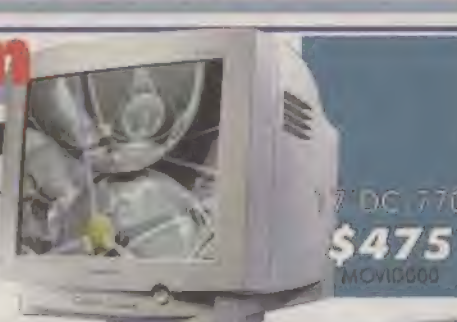
PanaSync S110

The 21" monitor that takes brightness to a new level and places its focus on high image quality.

Specifications

- 21" flat screen monitor
- 0.25mm dot pitch
- Anti-glare, anti-static coating
- On-Screen display controls
- 1600x1200 max.res.
- 20" viewable area

\$2149 MOPAN001



Videocom

Model	17"DC-770	19" DA-995
Screen Size	16" Viewable	18"Viewable
Dot Pitch	0.27mm	0.25mm
Max Resolution	1280 x 1024 N/I	1600 x 1200 N/I
User Control	OSD	OSD
Price	\$475 MOVID000	\$995 MOVID001

3 YEAR ON SITE WARRANTY*

*QUEENSLAND, NSW, VICTORIA ONLY

17" DC-770

17" DC-770

\$475

MOVID000

19" DA-995

\$995

MOVID000

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CD Writers

RICOH

A single drive that does it all.

Reads, writes, Rewrites CD data.

The Ricoh MP6200 series drives have multi-function capabilities so they can efficiently handle any CD-based media from the world's first re-writable CD, Ricoh's CD-RW, to the write-once CD-R and CD-Rom. With just one drive, you can always choose the perfect media to suit your applications. Now supporting random access writing.



MP6200AR (EIDE) ATAPI
Internal EIDE CD-R/CD-RW Drive Direct CD Ver. 2.0, Easy CD Creator 95/NT, 1 CD-R Disc, 1 CD-RW Disc, Operation Manual, Audio Cable, Mounting Screws

Kit includes \$35 of Media products

\$599
MMRIC001

MP6200SR (SCSI)

Internal SCSI CD-R/CD-RW Drive Direct CD Ver. 2.0, Easy CD Creator 95/NT 4 CD-R Disc, 1 CD-RW Disc, Operation Manual, Audio Cable, Mounting Screws

\$695
MMRIC000

Fast writing and reading 6x read 2x write, CD-RW and CD-R writing, unlimited media selection

Ricoh CD-RW Disc 74 Mins
650Mb
MMRIC003 **\$35**

Ricoh CD-R Disc 74 Mins
650Mb
MMRIC004 **\$4**

UPS & Line Filters

Information stored on computers and distributed via the computer network is of vital importance for a small business. MGE UPS SYSTEMS is the first UPS manufacturer to design a range of UPS that meet the specific requirements and restrictions of small business staff and management: the price is reasonable and the package is easy to install and use.

	ES2+	ES5+	ES8+	ES11+
Power	220VA	480VA	780VA	1000VA
No DF power output	2	2	4	4
Fax/Modem line			✓	✓
Backup time for PC	5 min	23 min	44 min	78 min
Price	\$349	\$435	\$679	\$1025

ES + series for a total and manageable protection system. Plug and Play compatible, the solution - PAC 97-power management software games a powerful GUI interface to control features such as remote management and shutdown of multiply service.



	EL2	EL4	EL7
Power	220VA	450VA	750VA
No of power outputs	2	2	4
Fax/Modem Line			✓
Backup time for a PC	5 min	20 min	40 min
Price	\$259	\$335	\$Call

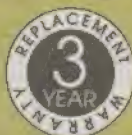
Perfect for the Soho, the EL Series offers affordable protection for your equipment.

Power Filter

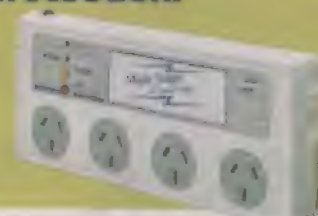
Computer and equipment protection!

- Powercor premium grade AC power filter technology to reduce surge/spike and transient damage.
- Power grid comes with 4 individually wired plugs.

Code	Model
PSGEN004	ZAPTRAP - Multistage filter
PSGEN005	ZAPCATCHER - Multistage filter with Telecom line surge protection



Price
\$140
\$150



HP SureStore



Adelong Computers

NEW HP SURESTORE 8100i

The fastest, easiest way to make your own CDs. With up to 24X read speed and up to 4X write speed, the new HP CD-Writer Plus 8100i offers unprecedented performance in CD-Recordable/CD-Rewritable technology. From start to finish, the HP CD-Writer Plus 8100i is designed for high performance. The 8100i comes complete with everything you need to make CDs right away, including blank CDs.

Connect to your computers IDE interface

Improved Performance! Write at 4X speed;
ReWrite at 2X; Read at up to 24X speed

Record your own music CDs

Drag and drop files to CD or save directly to CD from
software applications that you already own!

Burn a whole CD in under 18 minutes

World-class quality and support from Hewlett-Packard, the most trusted name in computer peripherals

Includes Adaptec CD software, IDE cable & CD/CDRW disc

\$835



Mavica

SONY

The camera.



The film.



The world's first and only floppy disk digital camera has just been improved. On a single floppy disk you can store up to 30 -40 shots in standard mode and 15 - 20 shots in fine mode. The new range of Sony Mavicas (MVC-FD81) not only lets you shoot a picture straight onto disk, but now lets you capture up to 60 seconds of moving footage.

MVC-FD51

CCD Lens
Image Size 640*480 (VGA)
2.5" Color LCD Display
4 Digital Picture Effects

\$1125

MVC-FD71

Imaging 1/4"
Progressive CCD Lens
10x Optical Zoom Lens
Image Size 640*480 (VGA)
Auto Focus with Manual Focus Ring

\$1525

MVC-FD81

35 mm Conversion
Imaging devices 1/3"
3X Optical Zoom Lens
Image Size 1024 x 768 XGA (JPEG)
MPEG movie mode (60sec)
Voice Memo Mode (10sec)

\$1945

Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday
Technical Support (5 Days a week 9am-6pm) Phone (02) 8344 3160



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1

Jaz 2 Drive

Want portability
and blistering speed?

The new format Jaz disks hold up to 2GB of data each. Jaz 2GB drives are 100% compatible with 1GB disks. Works with both MACs and PCs via an external SCSI interface.

JAZ 2GB DRIVE
(SCSI EXT.)

\$769
BUIOM018

JAZ 2GB DRIVE
(SCSI INT.)

\$759
BUIOM017



lomega

lomega Buz

All the hardware and
software you need
to be a video genius

Introducing the lomega Buz

-the easiest way to get

multimedia from camcorders,

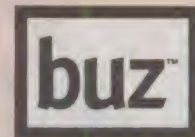
DVD, CD-Roms, VCRs and laserdiscs

into your PC! It's a video capture and

editing board combined with an Ultra

SCSI controller that lets you:

- Capture Multimedia (fullmotion) video, sounds, digital pictures, music) into a PC
- Edit it using the easiest software around



\$369

BUIOM023

Apple Mac **\$535**
BUIOM027

Available in Mac format

Zip Drive

Expand your hard drive
without limits

Heading Increase your storage quickly, easily and economically - as you need it. With 100MB Zip disks you can add as many disks as you need. Available in three types. Parallel / SCSI Mode / ATAPI / USB

NEW
250MB ZIP DRIVE

COMING SOON
Call for information

NEW USB ZIP 100MB DRIVE

Compatible with USB enabled PCs running Windows 95 Release B/C, Windows 98 and the Apple iMAC computers.



BUIOM026 **\$295**



ZIP DRIVE SCSI

\$245

BUIOM001

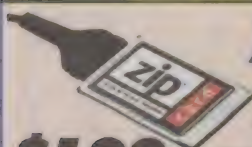
ZIP DRIVE PARALLEL

\$245

BUIOM000



Code	Model	Price
BUIOM007	100MB ZIP ATAPI OEM	\$173
BUIOM028	100MB ZIP ATAPI RETAIL ATAPI	\$225



Zip Card

PCMCIA to SCSI adapter. Zip card is a PCMCIA to SCSI adapter card that, when connected to your notebook computer and a SCSI Zip Drive, allows you to get 2-5 times the performance over a parallel port Zip Model.

\$199

BUIOM022

...the fastest and most convenient way to run a zip drive on your notebook

Jaz Traveller

Portability Solution...

Jaz Traveller is a SCSI to parallel port converter for the Jaz drive.

The Jaz Traveller allows you to connect an external Jaz drive to the parallel port on the IBM-compatible computers.



\$95

BUIOM013



Media Accessories



Code	Model	Price	Code	Model	Price
BUIOM012	100MB PC ZIP DISKS (1 PER PACK)	\$24	BUIOM020	JAZ MEDIA 1GB PC DISK (1 PER PACK)	\$190
BUIOM005	100MB PC ZIP DISKS (3 PER PACK)	\$69	BUIOM008	JAZ MEDIA 1GB PC DISKS (3 PER PACK)	\$529
BUIOM006	100MB PC ZIP DISKS (10 PER PACK)	\$195	BUIOM024	JAZ MEDIA 2GB PC DISK (1 PER PACK)	\$199
			BUIOM025	JAZ MEDIA 2GB PC DISKS (3 PER PACK)	\$580

INTERNET WEB SITE:
<http://www.adelong.com.au>
e-mail: info@adelong.com.au

HEAD OFFICE & SERVICE
34 Rosebery Avenue
Rosebery NSW 2018
Ph: (02) 9344 3188
Fax: (02) 9697 9777

CITY OFFICE
127 York Street
Sydney NSW 2000
Ph: (02) 9267 5272
Fax: (02) 9267 5042

Teac



Adeloma Computers

3 YEAR ON SITE WARRANTY*



• CMH1575 15" FST,
CRT Monitor 13.8"
(35cm) Viewable image
size

\$355
MOTEA000



• CMV1760 17" FST,
CRT Monitor 15.8"
(40cm) Viewable
image size

\$555
MOTEA001

\$1475
MOTEA002

• CMP1990 19" FST,
CRT Monitor 18"
(46cm) Viewable image
size

* Monitor Only

4 X 12 CD Recorder

12X Read & 4X Write

The new CD-RSSS from TEAC offers all of the advantages of true 4X write performance. It takes just fifteen minutes to create a typical 650MB CD.



SCSI Drive
\$515
MMTEA002

SCSI Retail Pack including
Adaptec SCSI Card, Cables,
CD-R Media, Mastering Software
Retail Kit
\$599
MMTEA004

32X CDROM Drive

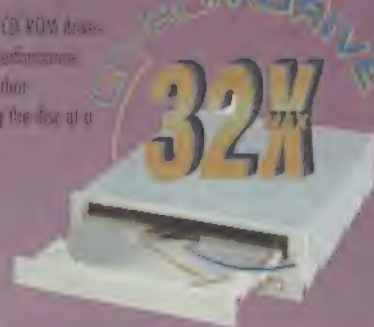
Experience 32X Performance

The all new CD-532 series of 32X CD-ROM drives provide the ultimate in playback performance. They benefit from CAV technology that optimizes the data rate by rotating the disc at a constant speed.

Available in both SCSI &
ATAPI interfaces.

ATAPI IDE
\$99
MMTEA001

SCSI
\$189
MMTEA003



TEAC 1.44MB Floppy Drives

For performance and reliability backed by a comprehensive 3 year warranty look no further than the TEAC FD-235 Floppy Drive. As used by Compaq and IBM, the FD-235 is regarded as the worlds best performing and most reliable floppy drive.



\$37
FDTEA000

Mitsui Gold CDR Media

Mitsui Gold CD-R is a highly specialized recordable compact disc that permanently stores any digitized data. It is distinct from other write once media in its playback compatibility with conventional audio CD and computer CD-ROM players.

\$2.50
MMGEN020



Portable CD-ROM Drive

CD-ROM to Go

The TEAC PortaCD 10X CD-ROM drive brings CD-ROM capabilities to your notebook. Use at our home and office, or take it when you're on the go.

\$465
MMTEA000



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Sales Hotline 02 8344 3100

21



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**ALTEC
LANSING**

Altec Lansing

ADA305 Digital PowerCube

The ADA305 Digital PowerCube delivers multidimensional audio excitement resulting from a Dolby Pro Logic decoder in the subwoofer. To deliver the multichannel audio, the Digital PowerCube uses Altec Lansing's patented side-firing speakers so that the audio is driven to the side and rear for a true multidimensional audio experience.

- 20 Watts RMS Satellite Speakers
- 2 x 3" full range drivers
- 6" Subwoofer
- Frequency Response 20Hz - 20Khz
- USB ready

\$399 MMALTD06

NEW



ACS45 PowerCube Speaker System

Introducing the Altec Lansing ACS45 PowerCube Speakers, a three piece multimedia audio solution at an unbelievable price. Experience the enhanced output of the PowerCube satellite system. Great for games and CD's, the ACS45 will bring hi-fi audio to your computer desktop today.

- 6 Watts RMS Satellite Speakers
- 3" full range driver
- 20 Watts RMS, 6" subwoofer
- frequency response 35Hz - 20 KHz

\$195 MMALTD01

**BEST Speaker
under \$200**



**PC
MAGAZINE
AUSTRALIA
EDITORS'
CHOICE**

ACS500 Surround Sound Speaker System

This superb three piece system delivers five channels of surround sound featuring Dolby Pro-Logic for Multidimensional excitement. The Satellite tower speakers deliver direct stereo imaging for hi-fi audiophile sound whilst giving the option for center and surround channel effects & sounds.

- 22.5 Watts RMS Satellite Speakers
- 2 x 3" full midrange driver
- 1/2" dome tweeter
- 40 Watts RMS, 6.5" subwoofer
- frequency response 35Hz - 20 KHz

\$450 MMALTD04



ACS48 PowerCube Plus Speaker System

The PowerCube Speaker System, from Altec Lansing is the market's leading affordable audiophile multimedia audio solution for the home or office. Comprising of a 3 unit system, allows you to experience hi-fi quality audio from your CDs, games or the Internet. In addition, the Powercube Plus 6" subwoofer is encased in wood, offering you a deeper low frequency response.

- 20 Watts RMS Satellite Speakers
- 3" full range driver
- 3/4" high frequency driver
- 40 Watts RMS, 6" subwoofer
- frequency response 35Hz - 20 KHz

\$289 MMALTD03

January 1998



**PC
MAGAZINE
AUSTRALIA
EDITORS'
CHOICE**

ACS91 Altec Lansing

The ACS91 PowerCube speaker system delivers powerful audio output to suit the home or office computer. Maintaining the tradition of audio quality synonymous with Altec Lansing these speakers are now available at an unbelievable price.

- 5 Watts RMS Satellite Speakers
- 3" full range driver
- frequency response 90Hz - 20 KHz

\$79 MMALTD00



D-Link

Ethernet Cards

10/100Mbps PCI Fast Ethernet Card

Ensure your future network upgrades are catered for with this 10/100 auto-negotiating network adapter. Plug and Play support for trouble free installation.



\$56
NWDLI027

NWDLI000	DE-220PCT ISA PnP 10Mbps Ethernet Adapter	\$35
NWDLI001	DE-220PCT PCI PnP 10Mbps Ethernet Adapter	\$40
NWDLI006	DE-905 Ethernet Network Kit (inc. 5-Port Hub, 2 x 10Mbps ISA Ethernet, 2 x 7 Meter CAT 5 Cable)	\$195
NWDLI026	DFE-500TX PCI 10/100Mb LAN Card	\$85

56K Fax/Modems

DFM - 560 High Speed Fax/Modems



\$165
NWDLI009

FMDLI001	56K Internal Modem	\$135
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Ethernet & Fast Ethernet Switches

For a cost effective solution to improving network performance, D-Link's range of switches

Utilizing a switch to segment your network will reduce unwanted network congestion and hence improve its performance.

8 Port 10/100 N-Way Switch DES-1008



Featuring 8 x 10/100 ports, the DES-1008 is ideal for multiple high speed servers or deployment to server farms

\$1535
NWDLI017

NWDLI011	DES-810 10 Port Ethernet Switch with 8 x 10Base-T & 2 x 100 BaseTX	\$799
NWDLI021	DES-815 12x10Mbps & 3x100Mbps Port Switch	\$1109

Ethernet PCMCIA Cards



\$206
NWDLI014

10/100Mbps Fast Ethernet PCMCIA Card

Make the most of your notebook computer by ensuring that it can handle both 10Mbps Ethernet & 100Mbps Fast Ethernet Networks no matter where you go.

NWDLI003	DE-660CT PCMCIA 10Mbps Ethernet Card	\$110
NWDLI025	DMF-560TX 10/100Mb LAN+56K Modem	\$495

10 & 100Mbps Ethernet HUBS

8 Port 10/100 N-Way HUB

These hubs provide an easy and cost effective transition to Fast Ethernet whilst remaining compatible with existing 10Base-T networks. Fully scalable to 80 ports in a 5 port stack. (DFE-908X)



\$685
NWDLI012

NWDLI019	DFE-916 16 Port 10/100 N-Way Stackable HUB	\$1345
NWDLI020	DFE-2624 24 Port 10/100 N-Way Stackable HUB	\$1859
NWDLI017	DE-805TP 5 Port 10Base-T Ethernet Hub	\$99
NWDLI004	DE-809TP 9 Port 10Base-T Ethernet Hub	\$150
NWDLI005	DE-816TP 16 Port 10Mbps Hub -Rock Mountable	\$310

Printer Servers

D-Link DP-602 Internet server makes connecting your LAN to the Internet easier than ever.



- Share ISP Account and Modems
- Dual 10/100 LAN Port
- Firewall Protection
- Admin through telnet browser

\$475
NWDLI027

Turn any printer into a network printer through D-Link's range of print servers.

NWDLI015	DP-300 2 x Parallel printer, 1x serial ethernet print server	\$429
NWDLI023	DP-101 1 Port Pocket Size Ethernet Print Server	\$299

Internet Software

Macromedia Dream Team



Want to develop the most professional web site, then you need the best in development tools. Macromedia's Dream Team combines Dreamweaver, Fireworks, and Flash 3.

Dreamweaver is the solution for professional Web site design and production. It is the only tool to offer Roundtrip HTML between visual and source editing for fast creation of great looking, cross browser Web sites.

Dreamweaver

\$565 SWMAC000

Dream Team

\$925 SWMAC001

Fireworks is the only web graphic design software you need! Fireworks' suite of text, design, illustration, image editing, URL, JavaScript, and animation tools can create everything for your web site.

Flash is the standard for interactive vector graphics and animation for the Web. Web designers use Flash to create beautiful, resizable, and extremely compact navigation interfaces, technical illustrations, long form animations, and other dazzling effects for their site.

Adobe Internet Pack



Easy to use and full of features. The Adobe Internet Pack is perfect for people just starting out in internet publishing. This pack contains ImageReady 1.0, ImageStyler 1.0, PageMill 3.0, PhotoDeluxe 2.0. Everything you need is included in this pack.

Adobe ImageReady provides Web professionals with a comprehensive tool for preparing graphics for use on the Web.

Adobe ImageStyler is the powerful new Web graphics software for the creative business user. ImageStyler's flexible toolset puts creativity and cool

Internet Pack

\$359 SWADT000

Web features in the hands of the non-design professional.

With Adobe PageMill 3.0, creating Web pages has never been easier. You can build a well-designed, content-rich Web site without needing to learn HTML or master complex applications.

Adobe PhotoDeluxe provides a fast and easy way to customize photos and add them to sales and marketing materials. It not only makes the alteration and repair of photos quick and easy, but also gives you hundreds of professionally designed templates.

Microsoft FrontPage 98



Microsoft FrontPage 98 is a quick, effective way to create and manage professional-quality Internet or intranet sites without programming. It makes it easy for new users and professional Web developers alike to build and maintain great-looking, professional-quality Web sites in no time.

Easy-to-use, leading edge features let you create professional Web sites without programming. Create WYSIWYG framed pages and draw HTML tables

FrontPage 98 upgrade

\$85 SWMST021

in the WYSIWYG FrontPage Editor. Drop in sophisticated, interactive functionality using FrontPage components.

Comprehensive management tools let you quickly build and maintain well-organized Web sites. With automatic hyperlink maintenance, you never have to worry about broken links. Plus flexible collaboration features let you work with others on your Web site.

FrontPage 98

\$175 SWMST022

Moore Music

Digital Audio Hardware and Software



XLERATE \$399 MMTUR000

- Real-Mode DOS SoundBlaster and SoundBlasterPro compatible
- DirectSound compatible
- Integrated Wavetable
- A3D Positional 3D-Audio

FIJI by TURTLE BEACH

PROFESSIONAL DIGITAL AUDIO CARD

- Studio-quality audio performance with better than 97db signal-to-noise ratio
- High-resolution, crystal-clear 20-bit stereo converters
- Accepts optional S/PDIF digital I/O interface (24-bit capable) and MIDI synthesizer module
- Supports 32 independent MIDI channels
- Includes award-winning Voyetra software for audio production



\$795 MMTUR001

\$1595 MMPIN000

ZULU

Multichannel external digital audio converter

Zulu is a 4-input/8-output (Tanago 8in/8out) external digital audio converter for computer-based systems. Zulu combines high-resolution 20-bit A/D and D/A converters with ADAT optical digital I/O for superior audio performance in a truly affordable package. Combining Zulu with an ADAT digital I/O soundcard, such as the Frontier Design Group WaveCenter(tm), eliminates noises that plague other computer soundcards. Since Zulu transfers digital audio data optically and has an independent power supply, it is isolated from all PC-generated noises, protecting sensitive audio signals.

FEATURES:

- 20-bit resolution with 128x oversampling converters
- >98dB S/N ratio, 0.002% THD+N
- Bi-color input level indicators on front panel

- Unbalanced -10dBV signal levels
- Professional 1/4" jacks (compatible with balanced TRS cables without an adaptor)
- ADAT optical in/out
- Rugged, compact half-rackspace enclosure

ZULU & Wave Center was \$2595 NOW \$1795 MMPIN000

ACID is a breaking loop-based music production tool from Sonic Foundry that brings unprecedented creative flexibility to loop arranging and editing. ACID include a library with hundreds of loops in many different instruments and musical styles:

- Multiple track looping and editing
- Change loop tempo or pitch on the fly
- Automatic matching of loop tempos and pitch

Acid \$549 SWACI000

Acid DJ \$99 SWACI001

Acid Loops Various titles \$129 SWACI004

Acid Rock \$99 SWACI002

Acid Music \$199 SWACI003

samplitude studio

Digital Multitracking Studio

The digital multi-tracking studio. The most powerful audio tool box ever built.

Check out the amazing possibilities available with digital multi-track recording. Simultaneous recording on multiple tracks with the highest audio quality and real-time effects. Professional multi tracker records, CD Mastering and CD Burning

Samplitude Studio \$995

Canon

Canon



Adelong Computers



BJC-50 PRCAN020 \$585

- Half the size of the BJC-80 but not half the performance.
- Featuring a InfraRed Port and Lithium Ion Battery which is good for 100 A4 prints.
- Maximum resolution of 720dpi at up to 5.5ppm
- Snap in the optional scanner head for 360dpi full colour scanning.

PRCAN001 \$137 Scanner head



BJC-80 PRCAN000 \$329

- Drop Modulation Technology - the dual drop size breakthrough that **produces smoother colour gradations.**
- Office laser quality finish & B&W speeds up to 5 pages per min. with dedicated black cartridge.
- Windows® 95 compatible IrDA infrared port for cable-less communications.
- Fits in half a briefcase & only 1.4Kg!

- **Optional scanner head for colour graphics, OCR & faxing.**

PRCAN001 \$135 Scanner head



BJC-4310SP PRCAN022 \$245

NEW IMPROVED SUPER ECONOMY MODE

- drop modulation technology uses dual drop sizes for smoother colour gradations with standard and photo realism inks.
- optional photorealism inks for photo gold standard printing.
- speed black cartridge prints up to 4.5 pages / minute.
- optional colour scanner for image acquisition, fax and copying functions (with appropriate software)
- plus banner printing and better internet printing.



BJC-255SP PRCAN017 \$169

- Super Economy mode for colour and B&W.
- Photo Mode printing for colour that rivals more expensive four-colour systems.
- Prints up to 2400 B&W pages and 600 colour pages.
- New high capacity black cartridge 20% more ink, no extra cost.
- Up to 5 times the output of direct competitors.



BJC-5000 PRCAN022 \$559

- 1440 dpi resolution
- New dual cartridge printin system
- A3 capable
- 7 colour photo inks
- Up to 7.5 ppm print speed
- When you own a BJC-5000, you'll be able to take on any job with confidence.
- 7-colour photo printing
- The dual cartridges print up to 7.5 pages per minute in black and up to 3 pages per minute in colour.

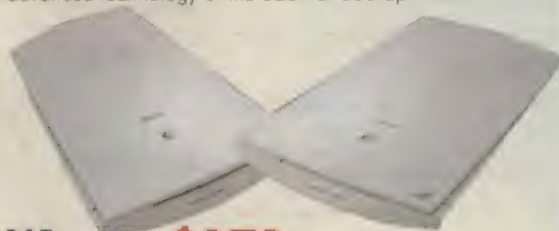


new BJC-7100 PRCAN012 \$585

- 1200 x 600 DPI
- 7-colour ink system and 9 saturation levels per pixel for **incredibly rich photographic half-tones.**
- Combined total of 1088 print nozzles firing up to 10,000 drops per second!
- P-POP (Plain Paper Optimised Printing) gives plain paper a coated paper quality finish.
- Documents printed with P-POP are 99.4% water fast!

FB320P IOCAN002 \$195

All the advanced technology of the 620P at 300 dpi



FB620P IOCAN003 \$272

It takes up less desktop real estate than any other colour flatbed scanner on the planet yet still **delivers exceptional 600 dpi scanning performance-ideal for businesses** with a variety of scanning needs.

- New Contact Image Sensor technology
- Optical Resolution 600 dpi
- Maximum Resolution 2400 dpi x 2400dpi
- 30 bit Colour

PowerShot A5 IOCAN004 \$1045

- The new Canon PowerShots A5 is everything you've always wanted from a digital camera. In fact, it's the smallest digital camera ever engineered with 1024 x 768 (XGA) resolution.
- Complementing its ultra-sensitive, high resolution CCD, the PowerShot A5 comes with a high-quality, low-distortion, 1/2.5 all-glass lens, ensuring consistently sharp images, shots after shot. Plus, the unique Stitch Assist mode makes it easy to create dramatic panoramas.



Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday
Technical Support (5 Days a week 9am-6pm) Phone (02) 8344 3160



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Sales Hotline 02 6344 3160

HP Printers



\$290
PRHPD039

HP 695C Most Versatile Colour Printer with optional Photo Colour. Creates stunning Photographic Output using 6 Colour System. Handles both Hp Banner (continuous) Paper (up to 20 sheets) and standard Cut Sheets paper (up to 100 sheets/20 envelopes), Print Speed 5ppm Black 1.7ppm Colour.



\$795
PRHPD045

HP 895C DeskJet 895 Professional Series colour printer, with HP's exclusive PhotoREt II colour layering technology, delivers brilliant photo-quality images and sharp, elegant black text on a wide range of papers and other media. Exceptionally fast printing at up to 10 pages per minute black and 6 pages per minute colour. USB compatible with Windows98



\$799
PRHPD041

HP 1100 LaserJet Printer and all-in-one Printer Copier Scanner for any size business Quality laser printing - faster than ever. HP has always set the pace in laser printing technology. The new generation HP LaserJet 1100 series sets another impressive pace, delivering a stunning 8 pages per minute print speed. The 600 dpi print resolution with HP's Resolution Enhancement technology (REt) makes every document more professional.

Code	Model
PRHPD042	Deskjet 420C
PRHPD002	Deskjet 670C Colour inkjet Printer 600dpi
PRHPD041	Deskjet 710C 3ppm Color /6ppm Black
PRHPD031	Deskjet 720C Printer 8ppm Black 600dpi
PRHPD025	Deskjet 1120C A3

Price	Code	Model	Price
\$185	PRHPD036	Deskjet 2000C	\$1429
\$239	PRHPD009	Laserjet 6L 6ppm at 600dpi Black	\$645
\$419	PRHPD046	Laserjet 1100A Printer Plus Scanner	\$799
\$485	PRHPD010	Laserjet 6P 8ppm 600dpi	\$1310
\$840	PRHPD011	Laserjet 6MP with Postscript	\$1644

EPSON

Epson Printers

STYLUS COL. 740

The new EPSON Stylus 740 is targeted at business/corporate and professional graphics users. These are users who demand a printer offering the highest performance and speed, maximum output quality, flexible options and affordability in purchase price and running costs. Designed for both Microsoft Windows 3.x/95 and Macintosh, the EPSON Stylus COLOR 740 also features optional network connectivity and optional software PostScript RIP. Printing at 1440 x 720 DPI and a maximum of 7ppm the Stylus 740 eclipses many desktop laser printers whilst providing unrivaled photo reproduction



\$495
PREPS021

EPSON PHOTOPC 600

Superb digital image quality and full-featured camera performance come together in the new EPSON PhotoPC 600 colour digital camera. Featuring a 2" TFT color monitor and optical viewfinder the PhotoPC has 4MB of internal memory which can hold 50 standard VGA or 16 Fine mode XGA images. In addition the PhotoPC 600 is equipped with a wide-angle lens that's ideal for business use. What's more, it gives you up to 3 x digital step zoom for even greater versatility and Panorama mode for those extra wide scenes.



\$905
IOEPS005

EPSON STYLUS COLOUR 440

The EPSON Stylus COLOR 440 is a remarkable new printer that produces dazzling, photo-quality right out-of-the-box! The EPSON Stylus COLOR 440 features photo-quality output with print resolutions of up to 720 x 720 dpi on plain paper.



\$253
PREPS019

STYLUS COL. 640

1440X720 DPI, 3PPM, WIN COMP With its remarkable 1440 x 720 dpi capability, the Epson Stylus COLOR 640 sets a new standard for cost-efficient, photo-quality colour printing without the need for expensive options.



\$320
PREPS020

STYLUS PHOTO EX.

The Epson Stylus Photo EX is the perfect printer for photo reproduction, pre-proof graphics. Industry-leading 1440dpi resolution with a six-colour ink system and A3 paper handling.



769
PREPS015

STYLUS COL. 850

It's industry-leading print resolution of up to 1440 dpi and high-speed printing capability makes the EPSON Stylus COLOR 850 the ideal printer for busy professionals. What's more, its ability to produce outstanding 1440 x 720 dpi printouts on plain paper allows eye-catching colour charts and graphics to be included in all printed material.



\$675
PREPS016

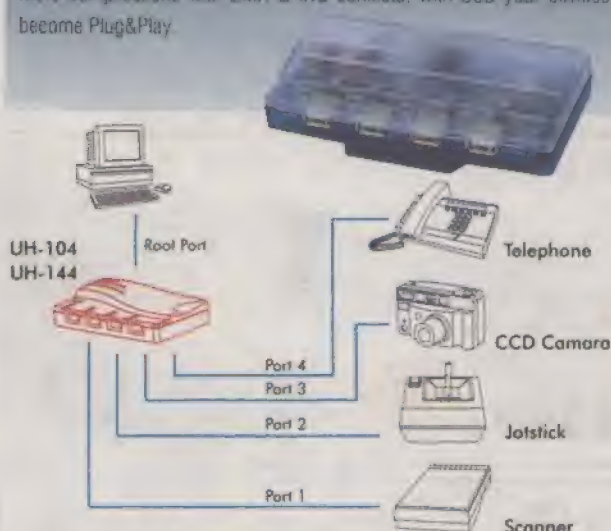
Data Switches



Adelony Computers

UNIVERSAL SERIAL BUS (USB) HUB

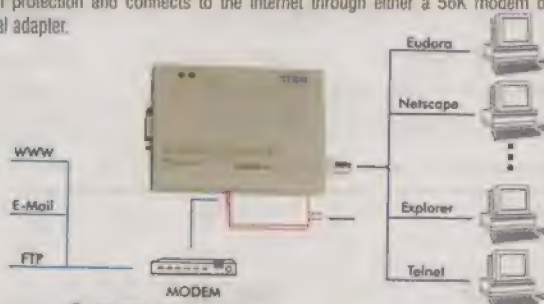
While most PCs will only support 2 USB ports, the UH-144 can support up to 4 devices with the option to daisy chain. It supports both full speed (12Mbps) and low speed devices such as keyboards and joysticks. No more complications with DMA & IRQ conflicts, with USB your devices become Plug&Play.



DSADE039 **\$85**

IP SHARING DEVICE

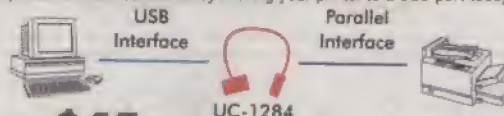
Wish everybody on your network had Internet Access but not the high costs and complexity associated with multiple accounts. If this is you, then the IS-100 IP Sharing Device is for you. By using a single Internet account with the IS-100, your whole network can have Internet Access simultaneously. The IS-100 can also act as a DHCP server and offer Firewall protection and connects to the Internet through either a 56K modem or ISDN terminal adapter.



DSADE040 **\$295**

USB TO IEEE-1284 BRIDGE

Connect your printer to your PC's USB Host controller with ease. Transparent and full automatic support for true bi-directional communication between your computer and your printer with no conflicts or installation hassles. Free up your parallel for other devices such as ZIP drives, Scanners and CD-ROMs by moving your printer to a USB port today!



DSADE041 **\$45**

Cases & APC UPS

ADELONG FILE SERVER CASE AT/ATX

- Features
- 2 x 300W Redundant Power Supplies
- 7 x 5-1/4" & 2 x 3-1/2" Bays

CAADE013

\$975

ADELONG DELUXE ATX MID CASE

- W 190mm
- D 425mm
- H 475mm

CAADE009

\$135

HOT

ADELONG DELUXE AT/ATX MID CASE

- W 192mm
- D 430mm
- H 540mm

CAADE004

\$155

ADELONG DELUXE AT/ATX DESKTOP CASE

- W 442mm
- D 473mm
- H 155mm

CAADE012

\$135

ADELONG AT MINITOWER CASE

- W 180mm
- D 415mm
- H 332mm

CAADE000

\$55

Power Supplies

Code	Model	Price	Code	Model	Price
PSGEN000	200W AT POWER SUPPLY	\$35	PSGEN003	300W ATX POWER SUPPLY	\$99
PSGEN002	200W ATX POWER SUPPLY	\$55			

APC "Industry standard reliable & affordable backup power solution"

Back-UPS - Best Value power protection for your PC

- * Compact Design
- * Protect your PC, Monitor, Laser printer with 1 device
- * Full-time EMI/RFI filters for noise filtration
- * Lightning and surge suppression to protect your hardware
- * Support for up to 4 Devices

Code	Description	Price
PSAPC008	Back-UPS 300VA	\$195
PSAPC000	Back-UPS 500VA	\$285
PSAPC009	Back-UPS 650VA	\$380

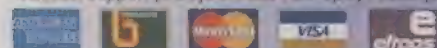
Smart-UPS - Power Management for advanced networks

- * Site-wiring fault indicator
- * Full-time Surge Suppression and Noise Isolation
- * User replaceable, hot swappable batteries
- * Software configurable features, data logging on 1000/700 model



Code	Description	Price
PSAPC010	Smart-UPS 420VA	\$509
PSAPC011	Smart-UPS 650VA	\$650
PSAPC003	Smart-UPS 700VA	\$970
PSAPC005	Smart-UPS 1000VA	\$1275

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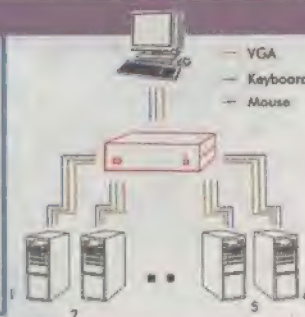
Sales Hotline 02 8344 3190

Data Switches

Auto CPU Switch Box

A CPU switch allows a user to control multiple computers with the ease of using a single console. That is, a single keyboard, mouse and monitor can control up to 8 computers simultaneously. A perfect partner for network administrators or the enthusiast with two or more computers.

- Supports Mouse emulation and keyboard emulation for automatic PC bootup
- Provides Serial & keyboard interfaces
- Supports VGA, SVGA & Multisync monitors
- Three level cascading for easy expansion
- LEDs give current mode status

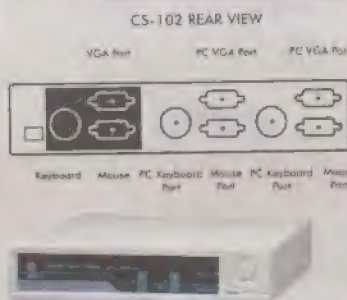


CS-102

Control up to 2 PCS with the entry level CS102

DSADE030 **\$245**

AT

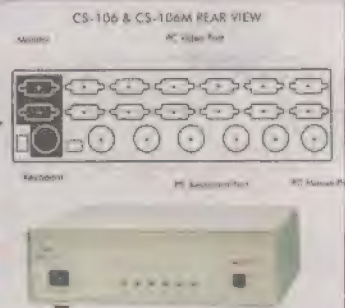


CS-106

Perfect for those managing several PCs. Auto scanning for monitoring PCs periodically

DSADE020 **\$399**

AT



CS-122

Supports both PS/2 and AT Style computers transparently

DSADE037 **\$275**

CS-104

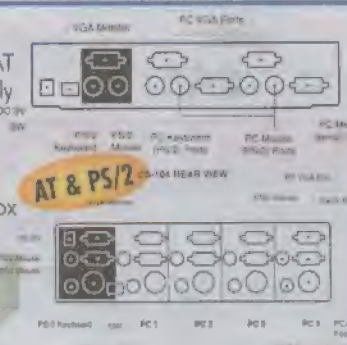
CS - 104 4 Port Switch Box

DSADE019 **\$395**

Item Code
DSADE038

Description
CS-114
(As CS-104 but with supporting intellimouse mouse)

\$415



CS-128

8 Port Switch Box

DSADE036 **\$695**

AT & PS/2



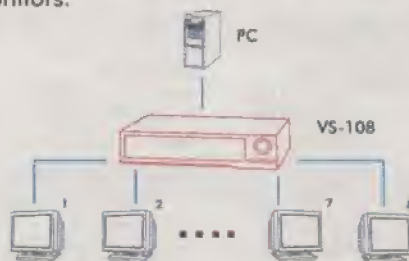
Item Code	Description	Price
CBGEN127	AT CABLE SET for CS-128	\$39
CBGEN128	PS/2 CABLE SET FOR CS-128	\$39
Item Code	Description	Price
DSADE041	CS-138 (As CS-128 but use same cable with CS114)	\$795

Special Shielded Cables For CPU Switches

CBGEN098	AT CABLE SET	\$35	CBGEN099	PS/2 CABLE SET	\$39
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Video Splitters

Video splitters are fast, flexible solutions for broadcasting video information to the public. They enhance video signals for long distance broadcasting. Great for presentations and demos, they allows 1 computer to hook up to several monitors.



CBGEN035 1.8M VGA Monitor Cable M/M **\$9**

VS-102 2 Port Video Splitter

DSADE000 **\$95**

VS-104 4 Port Video Splitter

DSADE001 **\$135**

VS-108 8 Port Video Splitter

DSADE002 **\$195**



Cables

USB CABLES

Item Code	Description	Price
CB-GEN155	1M USB CABLE A	\$15.00
CB-GEN156	1M USB CABLE B	\$15.00

PRINTER CABLES

CB-GEN000	6FT PRINTER CABLE	\$5.00
CB-GEN002	5 METERS PRINTER CABLE	\$12.00
CB-GEN003	10 METERS PRINTER CABLE	\$19.00
CB-GEN009	1.8M IEEE 1284 PRINTER CABLE	\$19.00

SERIAL CABLES

CB-GEN041	1M CENT50M TO CENT50M SCSI	\$15.00
CB-GEN043	1.8M CENT 50M CENT 50M SCSI	\$17.00
CB-GEN044	1M CENT 50M/DB25M SCSI	\$15.00
CB-GEN047	1M HONDA 50M/CENT 50M	\$25.00
CB-GEN048	1.8M HONDA50M/CENT50M	\$29.00
CB-GEN049	1M HONDA 50M/DB25 SCSI II	\$25.00
CB-GEN050	1M HONDA 50M/HONDA 50M	\$39.00
CB-GEN051	1M HONDA 68M/HONDA 68M	\$45.00
CB-GEN052	1M HONDA 68M/HON 50M	\$45.00
CB-GEN053	1M HONDA 68M/CENT 50M	\$45.00
CB-GEN083	HONDA 68 TO DB25 M SCSI III	\$45.00
CB-GEN057	INTERNAL SCSI III	\$85.00
CB-GEN057	INTERNAL SCSI III	\$85.00
CB-GEN060	INT SCSI-CABLE 7 CONNECT	\$15.00

KEYBOARD & VGA CABLES

CB-GEN071	1.8M KEYBOARD EXT M/F	\$9.00
CB-GEN075	5M KEYBOARD EXT M/F	\$15.00
CB-GEN077	1.8M PS/2 KB EXT M/F	\$12.00
CB-GEN078	1.8M PS/2 KEYBOARD M/M	\$12.00
CB-GEN079	1.8M KEYBOARD CABLE M/M	\$10.00
CB-GEN030	1.8M EGA/MOUSE EXT 9F/9M	\$9.00
CB-GEN031	1.8M EGA/MOUSE 9M/9M	\$9.00
CB-GEN032	1.8M VGA EXT 15M/15F	\$9.00
CB-GEN036	MONITOR SPLITTER 15M/15F*2	\$15.00
CB-GEN037	1.8M RGB CABLE 15M/BNC*5	\$25.00

SCSI CABLES

CB-GEN042	1M CENT50M TO CENT50M SCSI	\$15.00
CB-GEN043	1.8M CENT 50M CENT 50M SCSI	\$17.00
CB-GEN044	1M CENT 50M/DB25M SCSI	\$15.00
CB-GEN047	1M HONDA 50M/CENT 50M	\$25.00
CB-GEN048	1.8M HONDA50M/CENT50M	\$29.00
CB-GEN049	1M HONDA 50M/DB25 SCSI II	\$25.00
CB-GEN050	1M HONDA 50M/HONDA 50M	\$39.00
CB-GEN051	1M HONDA 68M/HONDA 68M	\$45.00
CB-GEN052	1M HONDA 68M/HON 50M	\$45.00
CB-GEN053	1M HONDA 68M/CENT 50M	\$45.00
CB-GEN083	HONDA 68 TO DB25 M SCSI III	\$45.00
CB-GEN057	INTERNAL SCSI III	\$85.00
CB-GEN060	INT SCSI-CABLE 7 CONNECT	\$15.00

SCSI ADAPTORS

Item Code	Description	Price
CB-GEN131	HONDA50F/CENT50M	\$30.00
CB-GEN132	HONDA50M/CENT50F	\$25.00
CB-GEN133	HONDA50F/CENT50F	\$32.00
CB-GEN134	HONDA50F/DB25M	\$25.00
CB-GEN135	GENDER CHANGER CEN50 F/F	\$12.00
CB-GEN136	HONDA68M/CEN50F	\$35.00
CB-GEN137	HONDA68F/CEN50M	\$38.00
CB-GEN138	HONDA68M/HONDA50F	\$39.00
CB-GEN139	HONDA68F/HONDA50F	\$40.00
CB-GEN140	HONDA68M/HONDA68F	\$45.00
CB-GEN141	HONDA68F/HONDA68F	\$45.00
CB-GEN149	INT. SCSI 50F/68F	\$40.00
CB-GEN143	INT. SCSI 50F/68M	\$30.00
CB-GEN144	INT. SCSI 50M/68F	\$20.00
CB-GEN145	INT. SCSI 50M/68M	\$20.00
CB-GEN146	INT. SCSI 50M/50F BRACKET ADAPTER	\$20.00
CB-GEN147	INT. SCSI 50M/68F BRACKET ADAPTER	\$25.00
CB-GEN148	INT. SCSI 50M/DB25 BRACKET ADAPTER	\$20.00
CB-GEN150	INT. SCSI 68F/68F BRACKET ADAPTER	\$35.00



USB A

USB B

NETWORKING

CB-GEN065	5M COAXIAL CABLE WITH BNC	\$12.00
CB-GEN066	10M COAXIAL CABLE WITH BNC	\$15.00
CB-GEN067	20M COAXIAL CABLE WITH BNC	\$20.00
CB-GEN070	BNC TERMINATOR	\$3.50
CB-GEN071	BNC T CONNECTOR	\$3.50
CB-GEN073	2M RJ45 CABLE	\$10.00
CB-GEN074	5M RJ45 CABLE	\$15.00
CB-GEN076	10M RJ45 CABLE	\$20.00
CB-GEN078	20M RJ45 CABLE	\$30.00
CB-GEN081	40M RJ45 CABLE	\$59.00
CB-GEN084	2 METRE RJ45 CABLE-CROSS	\$12.00
CB-GEN087	10 METRE RJ45 CABLE-CROSS	\$25.00

PARALLEL

CBGEN038	1.8M PARA LAPLINK DB25M/M	\$12.00
CBGEN039	5M PARAL LAPLINK DB25M/M	\$15.00
CBGEN040	10M LAPLINK PAR DB25M/M	\$19.00

POWER & I/O

CBGEN058	FLOPPY CABLES	\$6.00
CBGEN059	IDE CABLE 3 CONNECT	\$6.00
CBGEN061	INTERNAL POWER SPLITTER	\$5.00
CBGEN062	1.8M WALL TO PC POWER CABLE	\$6.00
CBGEN063	1.8M PC TO MONITOR POWER CABLE	\$7.00

SCSI TERMINATORS

CB-GEN045	CENT 50M SCSI TERM ACTIVE	\$25.00
CB-GEN046	CENT 50M TERM/C50M/C50F	\$19.00
CB-GEN054	HONDA 50M TERMINATOR ACT	\$25.00
CB-GEN055	HONDA 68M TERMINATOR ACT	\$39.00
CB-GEN056	INTERNAL TERMINATOR ACT	\$20.00



PS/2



RJ 45



BNC



serial mouse



Centronics 50



Honda 68



Honda 50



DB 25

Ink & Toner

Canon

Code	Description	Printer compatibility	Price
INCAN000	BC01 BLACK	BJ10/20	\$45
INCAN001	BC02 BLACK	BJ200/BJ210/BJ240	\$45
INCAN002	BC05 COLOUR	BJ210/240	\$49
INCAN003	BC06 PHOTO COLOUR	BJ240	\$49
INCAN004	BC06 PHOTO COLOUR KIT	BJ240	\$65
INCAN005	BC09F FLURO COLOUR	BJ210/BJ240	\$79
INCAN006	BC10 BLACK & HEAD	BJ30/BJ70	\$55
INCAN007	BC1-10 BLACK	BJ30/70	\$25
INCAN008	BC11 COLOUR & HEAD	BJ70	\$65
INCAN009	BC1-11 BLACK (3 PK)	BJ70	\$25
INCAN010	BC1-11C COLOUR (3 PK)	BJ70	\$35
INCAN011	BC20 BLACK & HEAD	BJ4000 SERIES	\$49
INCAN012	BC21 COLOUR & BLACK	BJ4000 SERIES	\$79
INCAN013	BC121 BLACK	BJ4000 SERIES	\$14
INCAN014	BC121C TRI-COLOUR	BJ4000 SERIES	\$29
INCAN015	BC22 PHOTO	BJ4200/BJ4500	\$75
INCAN016	BC22 PHOTO KIT	BJ4200/BJ4500	\$95
INCAN017	BC29F FLURO COLOUR	BJ4000 SERIES	\$75
INCAN018	BJ12018 BLACK	BJ600 SERIES	\$25
INCAN019	BJ1201C CYAN	BJ600 SERIES	\$15.50
INCAN020	BJ1201M MAGENTA	BJ600 SERIES	\$15.50
INCAN021	BJ1201Y YELLOW	BJ600 SERIES	\$15.50
INCAN022	BJ1642 BLACK	BJ300/330	\$29
INCAN023	BJ1643 BLACK	BJ800/880	\$45
INCAN024	BJ1643C CYAN	BJ800/880	\$49
INCAN025	BJ1643M MAGENTA	BJ800/880	\$49
INCAN026	BJ1643Y YELLOW	BJ800/880	\$49
INCAN027	BJ1801 BLACK	BJ80	\$39
INCAN028	BC03 BLACK	BJ210SP	\$45
INCAN029	BC60 BLACK	BJC7000	\$59
INCAN030	BC61 COLOUR	BJC7000	\$69
INCAN031	BC62 PHOTO COLOUR	BJC7000	\$95

HEWLETT PACKARD

Code	Description	Printer compatibility	Price
INHDP000	HP51633M BLACK	HP PORTABLE	\$49
INHDP001	HP51626A BLACK	HP 500 SERIES	\$49
INHDP002	HP51629A BLACK	HP 600 SERIES	\$55
INHDP003	HP51645A BLACK	HP850C/1600	\$50
INHDP004	HP51640A BLACK	DJ 1200 SERIES	\$50
INHDP005	HP51606A BLACK	HP PAINTJET XL	\$55
INHDP006	HP51639A BLACK	PAINTJET XL300	\$39
INHDP007	HP51625A COLOUR	DJ500 SERIES	\$49
INHDP008	HP51649A COLOUR	HP 600 SERIES	\$55
INHDP009	HP51641A COLOUR	HP850C	\$55
INHDP010	HP51640C CYAN	DJ1200/1600	\$55
INHDP011	HP51640M MAGENTA	DJ1200/1600	\$55
INHDP012	HP51640Y YELLOW	DJ1200/1600	\$55
INHDP013	HP COLOUR PHOTO KIT	HP690C	\$79
INHDP014	HP 16A PHOTO INK	HP690/692/693	\$59
INHDP022	HPC1823A COLOUR	HP720/890/1120	\$59

EPSON

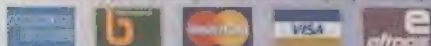
Code	Description	Printer compatibility	Price
INEPS003	SO20025 BLACK	400/800/1000	\$35
INEPS004	SO20034 BLACK	COLOUR/PRO/PROXL	\$45
INEPS005	SO20036 COLOUR	COLOUR/PRO/PROXL	\$85
INEPS006	SO20047 BLACK	200/820/1115	\$35
INEPS007	SO20049 COLOUR	1115/820/1500	\$45
INEPS008	SO20062 BLACK	STYLUS 1500	\$65
INEPS009	SO20066 COLOUR	STYLUS PRO XL+	\$95
INEPS010	SO20089 COLOUR	400/600/800/1520	\$45
INEPS011	SO20093 BLACK	C400/500/600	\$35
INEPS012	SO20097 COLOUR	C500/200	\$49
INEPS013	SO20108 BLACK	C800/1520	\$45
INEPS014	SO20110 PHOTOCOLOUR	PHOTO 700/EX	\$45
INEPS016	SO20187 BLACK	STYLUS 440/640	\$40
INEPS017	SO20191 COLOUR	STYLUS 440/640/740	\$45
INEPS018	SO20126 BLACK	STYLUS 740	\$45

Toner Cartridge

Code	Description	Printer compatibility	Price
TOHPD000	HP92295A	HP LASERJET II/III	\$135
TOHPD001	HP92274A	HP 4L/4ML/4P/4MP	\$125
TOHPD002	HP-C3906A	HP LASERJET 5L/6L	\$105
TOHPD003	HP92275A	HP IIP/IIIP/IIIP+	\$149

Code	Description	Printer compatibility	Price
TOHPD004	HP92291A	HP 451/451 MX/351	\$220
TOHPD005	HP-C3900A	HP 551/551 MX	\$325
TOHPD006	HP92298Z	HP 4/4M/5/5M/5M	\$165
TOHPD007	HP-C3900A	HP 4V/4MV	\$275
TOHPD008	HP	HP 5P/5MP/6P/6MP	\$145

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Ensure that your software and hardware is ready for the millenium with **CHECK 2000**



CHECK2000 PC

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SWGRE000

Check2000 PC Deluxe addresses all 5 layers. All user data is analyzed including spreadsheets and databases to ensure that all individual fields and cells are reported. Check2000 PC Deluxe goes further into advising on how to correct these problems.

Check2000 products suite detects the five "at risk" layers in PCs to help users and businesses fully understand the issues of the Millenium Bug. These five layers are:

1. Hardware BIOS
2. Operating System
3. Applications
4. User Data
5. Data Exchange

Check2000 PC address layers 1-3. Checks and corrects 98% of BIOS faults and analyzes the operating system and applications to determine which elements are at risk. Check2000PC also advises on how to resolve these issues.



CHECK2000 PC Deluxe

\$99

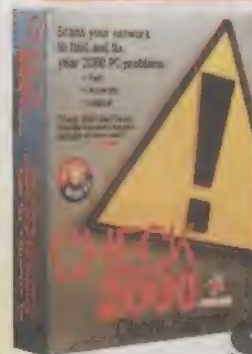
SWGRE001

NEW VERSION SUPPORTS

- Ability to automatically apply Bios FIX to machines that fail the Bios test
- Ability to integrate into Novell Zen environment
- Ability to obtain registry settings

Call for additional licenses

Greenwich Mean Time

CHECK2000
Client/Server
5 licenses
\$425

SWGRE002

Check2000 Client Server allows network-central deployment of the tools for checking all 5 layers and provides advise on correcting problems at each layer. Reports can be generated detailing where the millenium bug problems are, hence allows for a structured and risk-based approach to resolving these issues.

SUPPORTS MORE THAN
3000 APPLICATIONS

" DONT LET THE YEAR 2000 BUG AFFECT YOUR BUSINESS"

What is the Year 2000 or Millenium Bug?

The Year 2000 bug is a result of storing the year date as a 2 digit number instead of 4. Hence when we move into the Year 2000, the year date will click back to 00, causing an array of problems for hardware and software. However with Check2000 you can be alerted of your problems today, so that your business can be rid of all bugs before its too late.

" TODAY CHECK2000
IS ESTABLISHED AS THE
STANDARD BY WHICH OTHER
YEAR 2000 PRODUCTS ARE
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- Superannuation contributions, including salary sacrifice



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HEWLETT-PACKARD

Just announced HP
ScanJet 3200C and
5200C Page 34

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INDEX

PCs/Notebooks/
Servers
3 3Com Palm III
4/5 Toshiba NBooks
6/7 IBM NoteBooks
8/9 IBM Desktops
10 HP Notebooks
11 HP Desktops
12 Compaq NBooks
16 Sharp
Back-up
13 Iomega
21 APC Back-up
Networking/Upgrade
Components
14 3com Networking
15 Netgear
16 D-Link
17 Intel
18/19 Cisco
Monitors & Graphics
22 AVA Projectors
23 Sony monitors
24/25 Philips monitor
Modems
26 Banksia modems
27 NetComm modems
28 Dynalink Modems
29 3Com Modems
30 Xircom Modems
Printers, All-in-one,
Scanners, Cameras
31 Canon Print/Scan
32 Epson Printers
33 Tektronix Lasers
34 HP Scanners
35 HP DeskJets
36 HP Lasers
37 HP All-in-One
Software Utilities
20 Seagate Software
38 Seagate Software
39 Novell
40 Visio
41 Symantec Utilities
42 McAfee Utilities
Software Applications
43 MYOB Accounting
44 Extensis Plugins
44 Logitech Cameras
45 Adobe Software
46 Corel Software
47 Macromedia
48 IBM ViaVoice
49 Inprise
50 Philips Speech
51 SOHO Software
52 Microsoft Press
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3Com connected organisers put important information at your fingertips. The Palm III connected organiser is the latest addition to the award winning line of small, smart connected organisers from 3Com. At just 12cm tall and 161 grams (batteries and all), 3Com connected organisers are small enough to fit in your shirt pocket or purse, and powerful enough to keep you organised anywhere you go.

Store approximately:

- 6000 addresses
- 5 years of appointments (approximately 3000)
- 1500 to do items
- 1500 memos
- 200 e-mail messages

Organiser Applications :

Date Book, Address Book, Mail, To Do List, Memo Pad, Expense, Calculator, Security, Games, HotSync.

For remote synchronisation: download Enhanced HotSync technology from www.palm.com

Desktop Organiser Software:

Date Book, Address Book, Mail, To Do List, Memo Pad, Expense report templates (Excel 5.0 or higher)

\$669

(59857)



Drag & drop
links to
Microsoft
Word
and Excel

Desktop import
& export
formats; CSV,
TAB Delimited,
and TXT

Includes cradle
and cable

Palm OS™ 3.0

InfraRed
Communication

PalmPilot™ - Accessories



Slim
Leather
Case

(63801)

\$53



Stylus
Pens
3-pack

(60675)

\$23



Leather
Belt Clip
Case

(63271)

\$49

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TOSHIBA



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Direct**

www.hl.com.au/cat/toshiba

For the latest pricing and information please check out the Web Direct Link.

Protect your valuable notebook with a Toshiba bag



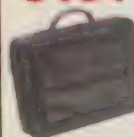
A4 Leather notebook bag
(12716)

\$184



NotePrem mobile office koskin bag
(01761)

\$184



A4 koskin notebook bag
(24795)

\$78

Enhanced port replicator II Tecra 8000
(51747)

\$729

Notebook Models

Harris TechnoRent rental plan subject To Approved Purchasers.
Rental figures shown are for 36 month terms. Please call us for latest figures.

	NEW	PRICE DROP	NEW	NEW	NEW	
All models in table feature USB	Satellite 2520CDT	Satellite 4010CDT	Satellite 4030CDT	Satellite 4060XCDT	Satellite 4080XCDT	Libretto 110CT
Processor	AMD K6-2 300MHz	Pentium II 266MHz	Celeron 300MHz	Pentium II 333MHz	Pentium II 366MHz	The world's smallest PC- runs full Windows® 95
RAM Std/Max	64/192 MB	32/160 MB	64/192 MB	64/192 MB	64/192 MB	P 233MHz
Hard Disk	4GB	3.8GB	4GB	4GB	6GB	32MB RAM
Screen	12.1" TFT	12.1" TFT	13.3" TFT	14.1" TFT	14.1" TFT	4GB HDD
Display	800 x 600	800 x 600	1024 x 768	1024 x 768	1024 x 768	7.1" TFT
CD-ROM	24x max.	24x max.	24x max.	24x max.	24x max.	800x480
Mic & Spkr	Speakers	Yes	Speakers	Speakers	Speakers	Weighs 1kg
Battery Life	3+ hours	2.5+ hours	3+ hours	3+ hours	3+ hours	(70736)
Port replicator	No	No	Yes	Yes	Yes	\$3,594
Select bay	No	No	No	No	No	Rent* T.A.P.**
DVD capable	No	No	No	No	No	\$27.98/wk
Weight	3 kg	3.1 kg	3 kg	3 kg	3 kg	
Warranty	1 Year	1 Year	1 Year	1 Year	1 Year	
DAA modem	No	No	No	No	No	
Op. system	Win 95/98	Win 95/98	Win 95/98	Win 95/98	Win 95/98	
Rent 3 Yrs.**	\$27.17/wk*	\$29.56/wk*	\$31.12/wk*	\$39.58/wk*	\$47.57/wk*	
Inc Tax	\$3,450	\$3,798	\$3,998	\$5,240	\$6,298	
Part number	(30599)	(70737)	(72302)	(72303)	(72304)	

	NEW	NEW	NEW	NEW	NEW	NEW
All models in table feature USB	Portégé 3020CT	Portégé 7020CT	Tecra 8000 333	Tecra 8000 333	Tecra 8000 366	Tecra 8000 366
Processor	Pentium 300MHz	Pentium II 366MHz	Pentium II 333MHz	Pentium II 333MHz	Pentium II 366MHz	Pentium II 366MHz
RAM Std/Max	32/96 MB	64/192 MB	64/256 MB	64/256 MB	64/256 MB	64/256 MB
Hard Disk	6GB	6GB	6GB	6GB	10GB	10GB
Screen	10.4" TFT	13.3" TFT	13.3" TFT	13.3" TFT	14.1" TFT	14.1" TFT
Display	800 x 600	1024 x 768	1024 x 768	1024 x 768	1024 x 768	1024 x 768
CD-ROM	No	No	24x max.	24x max.	24x max.	24x max.
Mic & Spkr	Yes	Yes	Yes	Yes	Yes	Yes
Battery Life	2.5+ hours	2+ hours	3+ hours	3+ hours	3+ hours	3+ hours
Port replicator	No	No	No	No	No	No
Select bay	No	No	Yes	Yes	Yes	Yes
DVD capable	No	Yes	No	No	No	No
Weight	1.3 kg	1.9 kg	2.9 kg	2.9 kg	2.9 kg	2.9 kg
Warranty	3 Years	3 Years	3 Years	3 Years	3 Years	3 Years
DAA modem	No	Yes	Yes	Yes	Yes	Yes
Op. System	Win 95/98	Win 95/98	Win 95/98	Win NT 4.0	Win 95/98	Win NT 4.0
Rent 3 Yrs.**	\$31.88/wk*	\$55.86/wk*	\$49.77/wk*	\$51.28/wk*	\$64.51/wk*	\$65.98/wk*
Inc Tax	\$4,095	\$7,395	\$6,589	\$6,789	\$8,540	\$8,735
Part number	(72301)	(72305)	(72306)	(72307)	(72308)	(72309)

MARCH

Page
4

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Direct

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Hot new notebook models



Satellite 2520CDT

(30599)

\$3,490

Rent* T.A.P.** **\$26.86**
per week



GREAT PRICE!

- AMD K6-2 300MHz
- 64MB RAM
- 4GB HDD
- 12.1" TFT

See page 4 for more specifications



Satellite 4030CDT

(72302)

\$3,998

Rent* T.A.P.** **\$31.12**
per week



EXCELLENT VALUE!

- CELERON 300MHz
- 64MB RAM
- 4GB HDD
- 13.3" TFT

See page 4 for more specifications



Satellite 4080XCDT

(72304)

\$6,298

Rent* T.A.P.** **\$47.57**
per week



PLENTY OF POWER!

- PENTIUM II 366MHz
- 64MB RAM
- 6GB HDD
- 14.1" TFT

See page 4 for more specifications



Portégé 7020CT

(72305)

\$7,395

Rent* T.A.P.** **\$55.86**
per week



ULTRA-PORTABLE!

- PENTIUM II 366MHz
- 64MB RAM
- 6GB HDD
- 13.3" TFT
- 1.9kg

See page 4 for more specifications



Memory upgrades for Toshiba notebooks

32MB

For Tecra 8000/
Portege 7000

\$199

(29356)

64MB

For Tecra 8000/
Portege 7000/
Satellite 4000

\$350

(29348)

Call for more RAM options or see Web Direct Link.

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MARCH
Page
5

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IBM ThinkPad i-Series

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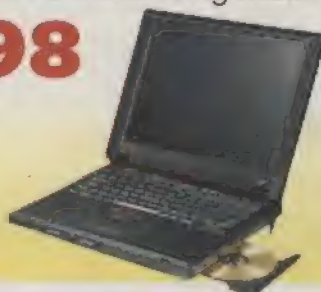
Sleek design, Active Matrix Screen

Easy to Use with Outstanding Multimedia & Great Audio

\$3,598

(73082)

Rent* T.A.P.**

\$28.01 per
week


Pentium® 300MHz with MMX
12.1" TFT Active Matrix Screen
4.3 Gigabyte Hard Disk Drive
32MB RAM
24x CD-ROM Drive
56Kbps Modem
NiMH Battery
Windows® 98

RAM Options

16MB IBM RAM:
ThinkPad 600/770ED

(51960)

\$182

Call for other options



*Rental available for
approved business use,
over 36 months. We can
obtain fast approvals.
Please call.

Black
Scrollpoint
Mouse

(53323)

\$58

5.1GB ThinkPad
770 IDE

Hard
DiskDrive:
11J8947

(51954)

\$1,895


IBM Thinkpad 380Z Series

Desktop-level performance

Fast Intel processors & large
active matrix screens for
razor sharp images
\$4,199

(68800)

Rent* T.A.P.** for

\$32.69 per week


Part #	Model	Proc	HDD	RAM	O.s.	Screen	\$
(68800)	2635-HGA	PII233MHz	4.0GB	32MB	Win98	13.3"TFT	\$4,199
(68801)	2635-JBA	PII300MHz	4.0GB	32MB	WinNT	13.3"TFT	\$5,549
(68802)	2635-JGA	PII300MHz	4.0GB	32MB	Win98	13.3"TFT	\$5,498

IBM Thinkpad 390 Series

Part #	Model	Proc	HDD	RAM	O.s.	Screen	\$
(20760)	2626-20M	P233MHz	3.2GB	32MB	Win98	12.1"TFT	\$3,320
(41710)	2626-50M	PII233MHz	3.2GB	32MB	Win98	12.1"TFT	\$3,959

IBM Thinkpad 600 45A

\$6,995

(70193)

Rent* T.A.P.** for

\$52.84 per week

- Powerful Intel Pentium® II 300MHz processor
- Bright 13.3inch display - TFT
- High capacity 5.1GB Hard disk drives
- Fast 24x - 10x CD-ROM Drive
- 64MB SDRAM
- 16-bit SoundBlaster-compatible stereo audio
- Microsoft Windows® 98

*Rental rate for business use, includes stamp duty and FID for NSW.

Enquire for slight variations in other states. T.A.P.**

NEW ThinkPad 770X

PII300MMX
64MB RAM
8.1GB HDD
14.1"TFT
1024x768
Win98
DVD Drive

\$10,125

Rent

\$71.16
per week
(70829)

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Page
6
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Computing Power & Portability

IBM ThinkPad 560Z Series



Ultraportability without compromise. The award-winning ThinkPad 560 notebooks are super-slim, lightweight and packed with the performance features our customers demand in a ThinkPad notebook.

- Mobile Pentium II 300MHz, L1 internal CPU cache 32KB, 512KB external
- Memory (RAM) 64MB / 128MB
- 6.4GB EIDE hard disk drive
- 800x600 TFT - active matrix screen, 12.1 inches
- NeoMagic NM2160, 128-bit, 2MB VRAM graphics card
- Headphone jack, microphone (integrated), microphone jack, Sound Blaster Pro audio support, speaker (integrated), video acceleration, volume control
- Crystal semiconductor CS4237B audio, 16-bit, one integrated speaker

Rent* T.A.P.** for **\$43.02** per week **\$5,695** (65731)



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IBM ThinkPad 600 55A Series



With the ThinkPad 600, IBM has assembled the perfect balance of mobile computing power and portability. The ThinkPad 600 delivers award winning ThinkPad technology, vibrant mobile multimedia, easy connectivity and UltraslimBay flexibility, as well as simple, super-portable convenience.

- Mobile Pentium II with AGP 300MHz
- Memory 64MB standard, upgradeable to 288MB
- 6.4GB hard disk drive
- 13.3" 1024x768 TFT - active matrix screen
- Microsoft Windows® 98
- DVD Driver and Movie Play Back

Rent* T.A.P.** for **\$55.89** per week **\$7,399** (71066)

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(31991)

\$20

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(49847)

Black
104 Key
Keyboard

\$94

(34331)

CD-ROM
Pouch

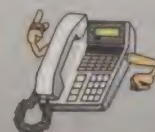
\$20

(31991)

*Rental rate for business use includes stamp duty and FID for NSW. Enquire for slight variations in other states.

IBM PC300GL Desktops**IBM PC300GL Celeron 333MHz - 6287-21A**

- Celeron 333MHz
- Ram Standard/Max: 32MB/256MB
- Hard Disk Size: 3.2GB (Ultra ATA, with S.M.A.R.T.)
- Graphics Chipset: S3 Trio3D AGP, 2 MB
- Operating System: Microsoft Windows 98
- CD-ROM Optional
- Audio Optional



Call now for this and other great IBM Desktop options

\$1,829

(72297)

Does not include monitor

With monitor: **\$2,236** (72297 + 47189)Rent* T.A.P.** for **\$17.41** per week with monitor**IBM PC300GL PII 400MHz - 6275-65A**

- Intel Pentium II 400Mhz Processor with 512Kb L2 Cache
- 32MB SDRAM
- 3.2Gb Ultra ATA HDD with SMART
- 3.5" 1.44 Mb Floppy diskette
- Graphics Chipset: S3 Trio3D AGP, 2MB
- Standard 104 keyboard
- Operating System: Windows NT Version 4.0
- CD-ROM Optional



Call now for this and other great IBM Desktop options

\$2,220

(65976)

Does not include monitor

With monitor: **\$2,627** (65976 + 47189)Rent* T.A.P.** for **\$20.45** per week with monitor

MARCH

Page

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IBM Netfinity File Servers

Netfinity⁵⁰⁰⁰ File Server

From.....

\$5,594

(69403)

Tower Model Pictured

- Intel Pentium II 350MHz Processor with 512KB Cache
- 64MB 100MHz ECC SDRAM with max. 1GB
- 2 of 2 PCI/ISA slots free, 3 of 3 PCI slots free
- Dual Channel Wide Ultra SCSI Disk Controller (SCSI-3 on planar)
- Integrated-ethernet 10/100 network Interface
- 32x max. CD-ROM disk drive
- 16-bit PCI
- Installed operating system optional
- Enhanced 2-button mouse
- 3.5" 1.44MB diskette drive
- Basic 101-key keyboard

Part #	Processor	IBM #	Type	\$
(69403)	PII 350Mhz	865912Y	Tower	5,594
(69404)	PII 350MHz	96591SY	Rack	5,760
(69405)	PII 400MHz	865922Y	Tower	5,850
(69406)	PII 400MHz	86592SY	Rack	6,199
(69407)	PII 450MHz	865931Y	Tower	6,389
(69408)	PII 450MHz	86593RY	Rack	6,749

Netfinity features

The Netfinity Server Tower comes complete with keyboard, mouse and NIC. The 5500 has integrated RAID support for 0, 1 or 5. 3 year limited on-site warranty.

Netfinity options

IBM
Ultrawide
SCSI HDD
Hot-Swap
4.51GB

\$1,649

(49682)

9.1GB

\$3,350

(65982)

IBM
12/24GB
DAT Tape
Backup

\$2,499

(52388)

Netfinity⁵⁵⁰⁰ File Server

\$9,169

(62174)



- 400MHz Pentium II processor with 512KB ECC L2 Cache
1 or 2 processors, upgradeable to Pentium® II Xeon
- 128MB RAM standard, maximum 1GB
- Dual Channel Wide Ultra SCSI RAID (IBM ServeRAID II on planar) and EIDE (on planar), 0MB installed.
- Maximum storage capacity: 54.6GB
- 6 x 32-bit, full size, PCI slots (4 hot swap) 1 x F.S. ISA
- CD-ROM 32x maximum
- Other features: Dial-in for control/monitoring/remote management (Modem required).
- Temperature and voltage monitoring

Part #	Processor	IBM #	Type	\$
(62172)	PII 350MHz	866011U	Tower	9,169
(62173)	PII 350MHz	86601RU	Rack	10,125
(62174)	PII 400MHz	866041U	Tower	9,425
(62175)	PII 400Mhz	86604RU	Rack	9,772
(69409)	PII 450MHz	866051U	Tower	11,745
(69410)	PII 450MHz	86605RU	Rack	11,745

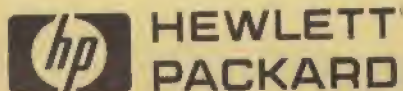
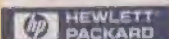
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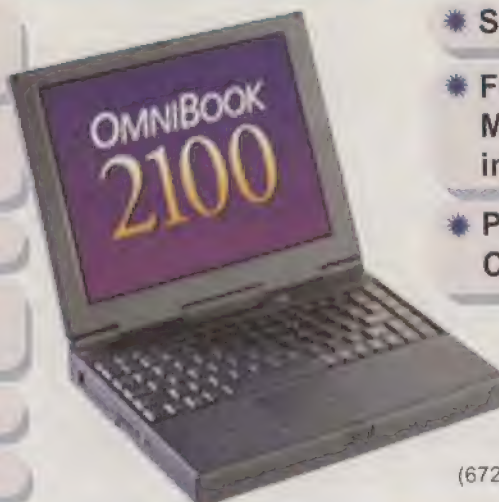
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HP Notebook Computers

HP OmniBook 2100

The Value notebook computer from HP designed specifically for corporate customers.

- 266 MHz Intel Pentium® II CPU
- 32MB RAM Expandable to 96
- 4GB Hard Disk
- 12.1" Active Matrix Display
- Windows 95
- 24 x CD-ROM



- SoundBlaster Pro audio
- Fully DMI Compliant/full Management software included
- Power Management & Cardbus support under NT

\$4,298

(67299) Rent for **\$33.46/Week**

#	Processor	HDD	RAM	OS	Screen	Rent/Week	Price
(67299)	P II 266MHz	4GB	32MB	Win 95	12.1 TFT	\$33.46	\$4,298
(73176)	P II 300MHz	4GB	64MB	Win 95	13.1 TFT	\$42.11	\$5,575

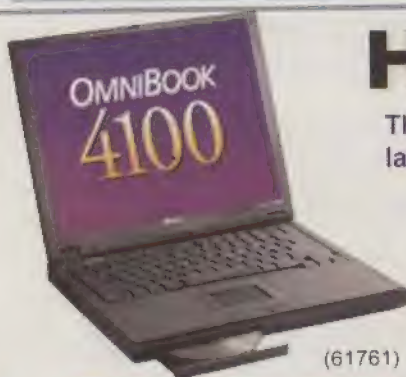
HP 620LX Colour Palmtop PC



Bright, 256-colour with 640x240 pixel display. Windows CE 2.0. 32-bit RISC processor running at 75 MHz. 16MB RAM and 10MB ROM. Pocket versions of Word, Excel, Outlook and PowerPoint. Receive and send faxes, voice recording, email.

(56366)

\$1,579



(61761)

\$5,915

HP OmniBook 4100

The Slimline Lightweight corporate performance notebook offering latest technologies optimised for use both in and out of the office.

- 6GB Hard Disk
- 14.1" TFT Display
- Windows® 95
- 24 x CD-ROM
- PII 266Mhz Intel CPU
- 32MB RAM expandable to 96MB
- Lithium Ion Battery (3hr)
- 3 Year Warranty

#	Processor	HDD	RAM	OS	Screen	Rent/Week	Price
(61761)	P II 266MHz	6GB	32MB	Win 95	14.1 TFT	\$44.68	\$5,915
(69164)	4150 PII300MHz	6.4GB	64MB	Win 95	14.1 TFT	\$53.10	\$7,029

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Page
10

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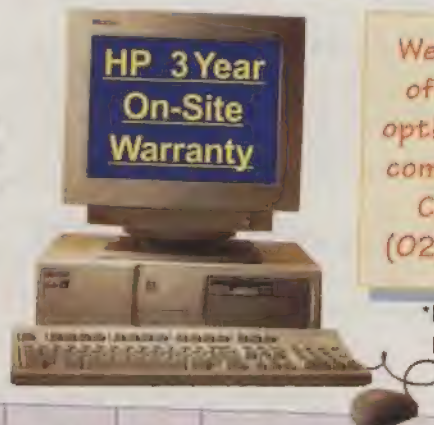


#	Brio Model	CPU	HDD	RAM	CD	Rent/Week*	Price	Includes 15" monitor
(71611)	7010 Celeron A	333MHz	4.3GB	32MB	32x	\$20.62	\$2,039	
(71612)	7011 Pentium II	350MHz	4.3GB	32MB	32x	\$24.67	\$2,439	
(71613)	7012 Pentium II	400MHz	8GB	64MB	32x	\$31.35	\$3,099	

HP Vectra

The choice of corporate Australia: HPs Vectra PCs offer the latest features at great prices backed by a leading 3 year next day ON-SITE warranty.

HP PCs have it all: performance, value, reliability and brilliant networking and remote management features.



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of RAM upgrade
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computer system.
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*Harris TechnoRent rental
plan subject to approved
purchasers. See
backpage for details.

#	Vectra Model	CPU	HDD	RAM	CD	Rent/Week*	Price	Includes 15" monitor
(71614)	6617 Celeron	333MHz	3.2GB	32MB	No	\$19.06	\$2,449	
(65662)	6572 Pentium II	350MHz	3.2GB	64MB	No	\$23.70	\$3,045	
(67278)	6582 Pentium II	400MHz	3.2GB	64MB	No	\$25.60	\$3,289	

14" monitor (55567)
\$299

15" monitor (42745)
\$499

17" monitor (65211)
\$799

21" monitor (40886)
\$2,899

HP E-50 Netserver

The ideal
NetServer
for small to
medium
business



- Pentium® II 333MHz MMX
- 512 KB Sec. Cache
- 32MB ECC RAM
- 3.5" Floppy Drive
- 24x CD-ROM Drive
- 2MB Graphics Adapter
- 1 Parallel & 2 Serial Ports
- 6 Expansion Slots
- Enhanced IDE Controller
- Single Channel Ultra Wide SCSI Controller
- 10/100 Embedded Network Interface Card
- Mouse + Keyb.

(66749)
\$3,209

COMPAQ

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www.ht.com.au/cat/compaq

Notebooks and Desktops

Compaq Armada 1575 Notebook

Please see the Web Direct Link or call us for pricing and availability of RAM upgrades for any Compaq Notebook

266MHz MMX
CPU

32MB RAM
(Expandable to 96MB)

12.1" CSTN
Display 800 x 600

Integrated
AC Adapter

(23358)

\$2,998

Rent* for
\$23.34
per week, T.A.P.



512KB
Cache

Li-Ion
Battery

3.2GB Hard
Disk Drive

20x
CD-ROM

Compaq Armada 1700 Notebook

(65047)

\$5,590

Rent* for **\$42.23**/week, T.A.P.

- Pentium II 266MHz MMX
- 32MB RAM (Max. 160MB)
- 4GB SMART HDD
- 13.3" Active TFT Display with 64-bit graphics accelerator 1024x768
- Integrated AC Adapter
- 24x CD-ROM
- 56KFlex Data Fax Modem

See Web Direct for Windows NT options

Also available : 300MHz model,
14.1" TFT screen, 5GB HDD

(68653) **\$5,799**

Rent* for **\$43.80** per week, T.A.P.



Proliant
1600
M6/350-1
Server
Intel Pentium
II CPU
350MHz

(68432)

\$5,375

Rent* for
\$40.60 per
week, T.A.P.
Call for info
on Harris
TechnoRent.



COMPAQ Deskpro EP

- Intel Celeron™ "A" 333MHz CPU
- 128KB L2 Cache
- 32MB SDRAM (256 Max)
- 4.3GB S.M.A.R.T. II HDD

- 4MB Matrox MGA G100 Graphics
- Windows® 95
- 14" monitor

(70279 + 61132)

\$1,992

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the options with the Web
Direct link or phone us.

* Rental rate for business use, includes stamp duty and FID for NSW. T.A.P.

Pricing** and specifications herein are subject to change without notice

All prices include sales tax &
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Page

12

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zip® 250MB

zip®

(71103)

USB \$299

Now USB-enabled PC users running Windows® 98 can connect iomega's sleek, translucent ice-blue **USB Zip drive**, and reap the benefits of simple connectivity and unlimited storage capacity. Once the iomegaWare software has been loaded, remove and swap the Zip drive with other USB devices without rebooting your PC.

NEW!



zip®

Starter Kit

(70623) **\$295**

Get started with the Zip starter kit! It's a portable parallel interface Zip drive plus four fun and practical, coloured 100MB Zip disks that are ideal for colour coding all of your computer stuff in the office, at home, at school, or anywhere. The colours make it even easier to find what you are looking for.



zip®

Ext.Parallel (21046) **\$245**

Ext.SCSI (21887) **\$244**



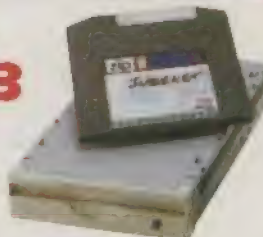
Increase your storage with interchangeable **100MB** disks. Zip drives & disks are small, light and convenient. Take them with you to move or share information. Works like your hard drive on a PC. Launch, run files & applications directly from the drive. Great for multimedia, software applications, presentations, graphics and more.

zip®

Internal ATAPI IDE

(16629) **\$193**

Fast, easy backup and archiving of your important information. Expand your hard drive without limits, 100MB at a time. High performance without the need or expense of SCSI connections. Connects to internal hard drive controller using standard IDE/ATAPI interface and internal power supply. Fits inside a standard 3.5" or 5.25" drive bay.



jaz®



Int. (27285) **\$545**

Ext. (27284) **\$595**

With whopping 1GB cartridges, you'll never run out of space. It's the super fast, extremely vast personal storage drive. 10-12 millisecond seek time means performance faster than most hard drives.

jaz®

2GB

Internal SCSI (57269) **\$758**

External SCSI (57270) **\$669**

The Jaz 2GB drive is faster than many hard drives, has a full **2GB** of storage space in each removable disk, gives you the freedom to take your files with you, and is backward compatible with industry standard Jaz 1GB disks.



jaz® 2GB + jaz traveller



Together for only

~~**\$874**~~

\$725

(71582)

The Jaz 2GB drive bundled with the Jaz Traveller adapter. The Jaz Traveller allows you to connect your portable SCSI Jaz drive to the parallel port on any PC, making it easy for you to use your Jaz drive on a computer that does not have a SCSI or PCI SCSI adapter installed.

buz®



(53998)

\$357

The easiest way to get multimedia from camcorders, DVD, CD-ROMs, VCRs and laserdiscs into your PC!

It's a video capture and editing board combined with an Ultra SCSI controller that lets you capture multimedia (full motion video, sounds, digital pictures, music) into a PC, edit it using the easiest software around, and share it using Jaz or Zip disks, VCR tapes or the Internet.

Zip 100MB disk (23772)

\$24

Zip 100MB disks 10pack (21889)

\$192

Zip PCMCIA SCSI accelerator card (35145)

\$199

Zip carry case (31823)

\$57

Zip parallel cable (46305)

\$40

Zip SCSI cable (46304)

\$40

Jaz 1GB disk (24218)

\$179

Jaz 1GB disk 3-pck (32844)

\$495

Jaz 2GB disk (61652)

\$199

Jaz 2GB disk 3pck (57271)

\$573

Jaz Jet - PCI SCSI controller (31591)

\$199

Jaz PCMCIA SCSI card (44744)

\$229

Jaz cable converter (46306)

\$30

Jaz universal power supply (35154)

\$38

Jaz Traveller (32860)

\$90

MARCH

Page

13

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3Com RAS 1500



The Grow-As-You-Go Remote Access System for small- to medium-sized organizations and service providers

Consists of two stackable components that integrate multiprotocol remote access server and WAN router technology with high-performance 56 Kbps (V.90) and/or ISDN modems, offering customers a complete remote access solution.

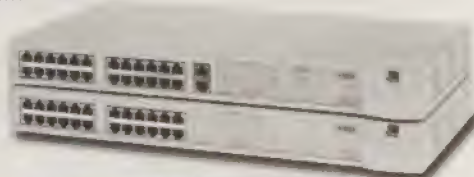
The Intelligent Access technology will automatically support dial-in access for SOHOs (Small Offices/Home Offices) and mobile users, LAN to LAN connection for branch to headquarters data access, and dial-out services for LAN to ISP/Internet access.

Call for pricing, or see Web Direct Link.

3Com SuperStack II Switch 610/630

Flexible Ethernet and Fast Ethernet switched connectivity for workgroups and individual users

Ensures zero packet loss under heavy load. Full SNMP and web-based management with RMON for proactive network management. Resilient links and spanning tree to protect against cable and equipment failures. Enhanced realtime multimedia support and data throughput.



SuperStack II Switch 610

Supports 24 10Mbps ports and 2 10/100 ports; duplex & speed are automatically negotiated on all ports. Support for 6,000 MAC addresses.

(70919)

\$2,199

SuperStack II Switch 630

Supports 10/100 Mbps auto-negotiation on all 24 ports. Support for 12,000 MAC addresses.

(70920)

\$3,835

3Com SuperStack II Baseline Switches

High-quality, unmanaged products providing cost-effective network solutions for a wide range of applications



The power of Ethernet switching at an affordable price. Includes two switched 10/100 Mbps ports as standard. A cost-effective solution to speed up the network. The Baseline switch has 12 or 24 10BASE-T switched ports and two 10/100BASE-TX (Ethernet or Fast Ethernet)

switched ports that automatically detect the speed of connected devices, optimizing network performance to 100BASE-TX, where applicable. Unmanaged.

12 ports (68748)

\$2,177

24 ports (73186)

\$2,485

3Com OfficeConnect Hubs

OfficeConnect hubs provide cost-conscious small businesses and offices with the foundation of an integrated system of small-office

networking. Easy to install and use. Simple troubleshooting. Diagnostic and Alert LEDs on the front panel. Compact design.



TP4 Four 10Base-T ports (39542) **\$127**

8/TPO Eight 10BASE-T ports (26769) **\$199**

TP400 Four shielded 100BASE-TX ports;MDI/MDIX switch on fourth twisted-pair port (56400) **\$239**

TP1200 Twelve shielded 100BASE-TX ports; twelve network utilization LEDs; MDI/MDIX switch on eighth twisted-pair port (56402) **\$699**

Do you have Internet access? Then have a look at the Web Direct Link (top of the page) for availability and "LIVE" pricing.



Oh, and why not register for special pricing?



NETGEAR

Web Direct

www.ht.com.au/cat/netgear

Now Networking is Easy!

NETGEAR Dual Speed Hubs

4 Port 10/100 Slimline Hub



This NETGEAR Hub connects multiple PC's to share printers, files, Internet Access, and E-mail communications.

- Auto-sensing dual speed ports
- Each port works at 10 or 100Mbps
- Easy, plug-and-play installation
- Compact, sturdy, metal case
- Vista network ports with built-in LEDs

(DS-104)
(70795)

\$259

8 Port Dual Speed (10/100) Hub Slimline



DS-108 (18755)

\$559



Window to the Future: DS-116

Ask about Dual Speed stackable Hubs (DS-508, DS-516, DS-524)

FS108 10/100 Mbps Slimline Switch



PRICE BREAKTHROUGH

- Full Duplex/Half Duplex operation
- 8x10/100Mbps switched ports
- External Power Supply

\$966

NETGEAR (70905)

Ask us about NETGEAR Integrated Fibre Switches

RM356 Analog Router

Connect multiple PCs to the Internet easily

This NETGEAR router provides shared Internet access in a box. Small offices/home users can connect multiple PCs to the Internet to access email & download information, programs, or games with a single connection, using one ordinary phone line and one Internet Service Provider account.

- Single-box Internet access solution: router + integrated 56K modem + integrated 4 port 10BaseT hub
- DHCP server
- Dynamic NAT+
- Dial-on-Demand routing
- Hi/fn (STAC LZS) compression
- Five year warranty



(70197)

\$629

10Mbps Ethernet Hubs

(53456)	EN104TP	4-port slimline 10baseT	\$ 83
(57629)	EN106TP	6-port slimline 10baseT	\$116
(53455)	EN104	4-port slimline 10baseT, BNC	\$123
(53458)	EN108TP	8-port slimline 10baseT	\$128
(53457)	EN108	8-port slimline 10baseT BNC AUI	\$174
(53459)	EN116	16-port slimline 10baseT BNC AUI	\$275
(17425)	EN516	16-port rackmount 10BT BNC AUI	\$398
(17435)	EN524	24-port rackmount 10BT BNC AUI	\$439

100Mbps Ethernet Hubs

(48831)	FE104	4 Port Slimline 100BaseTX Unmgd	\$229
(53461)	FE108	8 Port Slimline 100BaseTX Unmgd	\$380

RT328 ISDN Router



(68900)

\$739

Setting new standards in ease of installation, features & price. 128K MultiLink PPP, DHCP Server, Dynamic NAT+, Dial on Demand Routing.

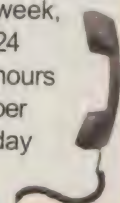
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compatible)

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(58728)

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(Speed
sensing, PnP)

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(53460)

NETGEAR
FA410
PCMCIA
Network Card
(60071)

\$236

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MARCH

Page

15

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Building networks for people

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10/100Mbps
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Fast Ethernet
PCI Adapter
(62956)

\$59



DE-805TP

Ethernet 5-
port mini
10Base-T
hub "Hubby"
(53599)

\$99

D-Link DMF-560TX



PCMCIA 10/100Mb LAN
& 56K Modem PC Card

The perfect solution for LAN/WAN applications in one PC card. This multifunction PCMCIA card combines Ethernet/Fast Ethernet LAN and the power of a V.90 K56 Flex Fax/Modem. Send faxes from a server, receive

faxes over the modem or access the Internet and access network resources over the network all at the same time.

- 10/100Mb Auto sensing LAN port
- V.90 K56 Flex fax/data/modem
- Rockwell Chip Set
- Uses only one PCMCIA type 2 slot
- Concurrent use of LAN and fax/modem
- Simple Plug and Play installation
- Supports Windows 95/98, NT and others
- Fully approved A-Tick, C-Tick, and Telepermit
- For Acer, Compaq, Digital, IBM, NEC, Toshiba notebooks

\$475

(59820)

NEW

D-Link DFE-908X

10/100Mb 8-port stackable dual speed hub



(60558)

\$687

- Integrated 10/100 switch
- 8RJ-45 NWAY, 1 RJ-45 uplink port
- Master
- Auto-sensing
- Cost-effective Ethernet to Fast Ethernet transition anytime
- Five hubs per stack

D-Link DES-810

10/100Mb 10-port combo switch



(53717)

\$799

- Features 8 10Mbps RJ-45 ports and 2 100Mbps RJ-45 ports; 1 uplink
- Capable of full-duplex or half-duplex on all ports
- Dynamic buffer allocation

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New Digital Laser Copier/Printer

SHARP
AL-1000
Laser
Copier/
Printer

(71062)

\$1,595



**HOT
NEW PRODUCT**



AL-840

Digital Laser
Copier/Printer

(72921)

\$1,450

- High-quality 600dpi digital laser copying/printing
- Standard Printing function (GDI) with two interface ports
- Scan Once Print Many function enhances productivity
- Auto Start function eliminates waiting time
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- Digital Photo mode
- Front-loading supply cartridges make replacement easy

A4
8cpm
Dual PC port
600dpi printing
400dpi scanning
250-sheet feeder
Zoom 50-200%
1-50 multi copies

PV-5000A

Windows® CE Notebook

(62669)

\$1,899



HC-4600

Windows® CE Notebook

(62671)

\$1,599



PCA-150

Ultra Light Notebook

(45143)

\$4,395



MARCH

Page
16

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Rent: Short or long term. Finance options available: IBM Easylease, AGC.



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intel®



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Web Direct

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Intel® InBusiness™

Small Business Networking



(58551)

\$819

Intel InBusiness™ Internet Station

- Multiple user Internet Access over a single line
- Simple web-browser configuration and management
- InstantIP™ technology saves time and money on Internet addresses
- Supports both analog and ISDN lines
- Two additional ports for "dial out" and "fax out"



(68444)

\$445

Intel InBusiness™ 8-Port 10/100 Hub

- Easily connects devices to create a Fast Ethernet network
- Simple installation, no software required
- 10/100 Auto-sensing each port



1 Port

\$435

(63213)

3 Port

\$749

(70916)

Intel NetportExpress™ 10/100 Print Server 3-port

The Netport Express 10/100 Print Server delivers outstanding performance, anticipating tomorrow's needs by exceeding the demands of today.

- Reliability and performance through Intel® processor technology
- Super low cost
- Intel i486 processor on board



(71213)

\$1,559

Intel InBusiness™ eMail Station

Introducing... an exciting new network appliance from the Intel InBusiness™ product line - the eMail Station!

Designed specifically for small businesses, the Intel InBusiness™ eMail Station is an easy way to facilitate communications. Simplified LAN and Internet e-mail services give the office a professional image with the company's own e-mail domain name.

Intel InBusiness™ 5- and 8-Port Hubs



5-port 10mbps hub: (58547)

\$115

8-port 10mbps hub: (58548)

\$139

Intel InBusiness™ 8-Port Switch and Switch Plus



8-port 10mbps: (58552)

\$499

8-port 10mbps

+

2x 10/100 ports: (58553)

\$669

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MARCH

Page

17

Add Cisco Systems to your

Cisco Catalyst Desktop Switches

*Maximize the
Power of Your
Intranet*



Cisco's Catalyst 2900 Series XL is a full line of 10/100 autosensing Fast Ethernet switches that offers outstanding performance, versatile modularity, and easy-to-use management. The Catalyst 2900 Series XL features models with different port densities, configuration options, and pricing to meet a broad range of network design requirements.

For more
information
on Cisco
products
call (02)
8912 9432



The mission-critical nature of today's applications raises the stakes for erratic performance - from lost productivity to the very ability to conduct business. Overcome these hurdles by delivering bandwidth to your users reliably and affordably with Cisco Catalyst desktop switches.

With reliable network connections:

- employees can more effectively access intranet applications and the resources they need to do their jobs
- IT spends less time reacting to network congestion
- a company gains a more productive workforce

Unlike hubs, which share a fixed amount of bandwidth, desktop switches guarantee bandwidth to individual users or network devices. With a combination of 10Mbps and 100Mbps connections, Catalyst desktop switches also offer a cost-effective means to migrate users to Fast Ethernet.

MARCH

Page
18

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Pricing** and specifications herein are subject to change without notice



Several finance methods
available, subject to approval



networking team

Benefits of Catalyst Desktop Switches



- With their own, dedicated bandwidth, users can access network resources whenever they need to, without competing with other users
- Less contention among users reduces collisions, further enhancing network performance
- LAN security increases because transmissions

are directed only to selected ports, and not across the entire LAN

- Bandwidth can be increased incrementally
- A modular design enables you to add users or high-speed uplinks, including Fast Ethernet, FDDI, ATM, and Gigabit Ethernet
- Built-in support for emerging multimedia and multicast applications: your company can adopt new, powerful business applications without concern for network congestion
- A simple Web-browser interface enables management from any PC or workstation on your network or over the Internet

With full wire-speed performance across all ports you can't buy a faster desktop switch!

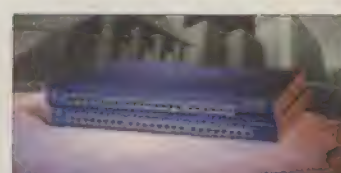
Fast EthernetChannel technology provides up to 800Mbps of bandwidth between Catalyst series switches and Cisco routers.



2908 XL



2916M XL



2924C XL and 2924 XL

Catalyst model	Switched 10BaseT/ 100BaseTX ports	Other technologies	Part number	Price
2908 XL	8	10/100BaseT AutoSense Switch	(70378)	\$ 2,325
2912 XL	12	100BaseFX, Fast Ethernet with 2 expansion slots. Fibre.	(72912)	\$12,950
2916M XL	16	10/100BaseFX Autosensing, (ATM, Gigabit Ethernet Modules optional)	(72915)	\$ 3,840
2924 XL	24	10BaseT/100BaseTX Auto-Sensing Fast Ethernet Switch	(72913)	\$ 4,225
2924C XL	22	22x 10BaseT/100BaseT Auto-sensing, 2x 100BaseFX ports	(65459)	\$ 5,072

For more information on Cisco products call (02) 8912 9432



Leading Backup Solution for NT

Backup Exec Windows 98



From the developers of the applets that Microsoft ship with DOS, Windows & Win98. Backup to most tape and backup devices, including CDW, DVD, DAT, Diskette, DLT, etc.

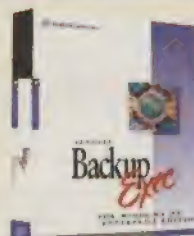
(66855) **\$125**

Backup Exec for NT Workstation



(17406) **\$199**

Backup Exec Server Editions



Single Server - protects one server and all attached workstations (69759) **\$865**

Multi Server - Protects an unlimited number of servers to one backup server (the server with the tape device attached) (70745) **\$1,750**

Some more popular Backup Solutions from Seagate

Exchange Agent Win NT 7.2

Protect your Exchange Servers with this reliable, intuitive and powerful add-on option to Seagate Backup Exec for NT (Single Server or Multi-server version required). Protect individual mailboxes including attachments/embedded objects.

\$950 (71524)

Microsoft SQL Agent Win NT 7.2

Protect your Microsoft SQL databases down to table levels - simple to use and intuitive. Client server flexibility allows management of local and remote SQL backups. Supports SQL version 6.0 and version 6.5.

\$954 (71270)

Remote Control DTMS

One of the fastest in the industry Supports NT & NetWare servers, DOS, Windows, Win95 and WinNT workstations. Also includes hardware and software inventory, software distribution & software metering.

50 nodes (72903) **\$3,989**

100 nodes (72904) **\$6,799**

Limited time offer for **GREAT PRICING** Competitive Upgrades from ArcServe



If you are unhappy with the ease of use, reliability and support of ArcServeIT, call today for a reliable solution to your data protection problems. Seagate Backup Exec - the world's leading NT backup solution.

Single Server NT	7.2	(71591)	\$399
Single Server Network	8.0	(72901)	\$399
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Multi Server Network	8.0	(67023)	\$635

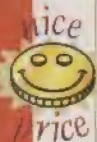
Server Monitoring - Seagate Manage Exec

Seagate Manage Exec provides pro-active server monitoring. Increase server uptime and availability. Works on NT or NetWare servers. Includes trend analysis. Simple to install & configure. Web or NT 4.0 interface.

(72906) **\$1,379**

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- Quick recharge
- User adjustable option switches allow you to save battery power
- Three battery back-up outlets to protect your work

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APC Back-UPS 500va (56230) **\$245**

APC Back-UPS 650va (56231) **\$355**

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For advanced workstations

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- Audible Alarms
- Network Ready
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- Universal Hardware Compatibility.

**PREVENT
DATA-LOSS!**



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APC Back-UPS Pro 420va (37947) **\$449**

APC Back-UPS Pro 650va (28512) **\$499**



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Affordable power protection for PC Servers

- Includes FREE APC PowerChute® Plus
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- 10 Base-T/100 Base-TX network protection



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APC Smart-UPS 620

(67198) **\$699**



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Symmetra**

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(71087)

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we use it
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(without
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(41355)

Pro 1400

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MARCH

Page

21

Professional Projectors

Which projector has a built in OHP?

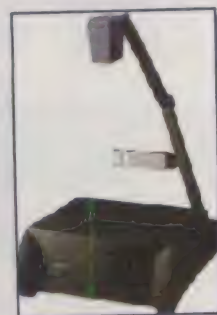


- Light and Portable
- SVGA through to UXGA resolution
- 500 to 1400 ANSI Lumens
- Adjustable focus and zoom
- Multiple input and output terminals
- TLP 410, 510 and 710 available without OHP function

TOSHIBA

All Toshiba projectors (except 4 series) use the new UHP Lamp technology for lower power consumption. Built in OHP function, acts like an Overhead Projector but can also project hard copies and 3D objects.

Toshiba	TLP411ES	(72520)	\$ 8,599
Toshiba	TY-G3E	(72523)	\$ 11,745
Toshiba	TLP511Z	(72527)	\$ 13,119
Toshiba	TLP711H	(72530)	\$ 17,478



Cheaper
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projectors
also
available,
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Now with 2 year Warranty! Conditions apply

CTX
CTX Opto

TRUE SVGA AT AN UNBELIEVABLE PRICE



- 500 ANSI Lumens
- True SVGA 800 x 600
- Lightweight at only 4.7kg
- Both Video and Computer inputs
- Bonus Free Carry Case now included

CTX EZ-Pro 585 projector (72536) **\$4,995**



Now with 2 year Warranty! Conditions apply

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Page
22

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or T/T. Call for details.

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Please call or see our Web Direct for more information on these and other Sony monitors.



Monitors	100ES	200ES	200GS	400PS	500PS
Our part number	(66055)	(58205)	(58798)	(57451)	(58544)
Trinitron® CRT Size	15"	17"	17"	19"	21"
Viewable Image Size	14"	16"	16"	18"	19.8"
Maximum Resolution	1280x1024 @60Hz	1280x1024 @60Hz	1600x1200 @60Hz	1600x1200 @ 75Hz	1600x1200 @ 85Hz
Price	\$599	\$990	\$1,299	\$1,995	\$3,145

Sony CD-R/RW

4x CD-R, 2x CD-RW CRX100EBK



(70899)

\$799

Internal rewritable CD-R/RW drive. 4x max CD-R writing, 2x max CD-RW writing, 24x max reading, EIDE (ATAPI) interface; 1MB cache, MTBF: 100,000 POH (duty 25%) INCLUDED: Adaptec SW, 1 blank CD-RW disc & a CD-R disc, cables & manual

3.5" Floppy Disk Digital Camera

Sony Digital Mavica MVC-FD91

Not just photos, but movies stored on a Floppy Disk!! Stores both high resolution still pictures (1024x768) XGA up to 40 shots, as well as full-motion video up to 60 secs onto a Floppy disk! 14x optical zoom, steady shot and stamina battery life up to 1500 shots. 2.5" colour LCD screen auto flash self timer, six picture index on LCD, date/time stamp and much more.

(70203)

\$2,675



Sony Digital Mavica MVC-FD81

Shares most of the same features as the MVC-FD91 with the exception of the Optical Steady Shot function and 14x zoom lens. The MVC-FD81 is instead equipped with a 3x zoom lens.

(69230)

\$1,990

Accessories



Soft Case MVC-FD81

(62746)

\$72



Battery Pack

(62951)

\$117



(70235)

5x DVD-Rom Retail Kit

Introducing the worlds first 5x DVD Drive. Offering Full CD Compatibility, DVD-ROM & DVD Video compatibility, it will run full-motion video, play high-quality interactive games & let you read database & multimedia files stored on DVD.

\$695

- Supplied with video cables MPEG decoder card and Two DVD titles
- 12 Month Warranty

DAT Tapes

4mm x 60M
1.3Gb

\$15

(06102)

4mm x 90M
2Gb

\$15

(06103)

4mm x 120M
4Gb

\$34

(13262)

Tapes are
also
available as
5 packs

4mm x 90M
2Gb - 5 Pk

\$55

(54085)

4mm x 120M
4Gb - 5 Pk

\$117

(24968)

5 1/4" MO
600Mb up to
1.3Gb

\$80

(30916)

2.3 / 2.6Mb
MO

\$119

(30936/30937)

MARCH

Page

23

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Let's Make Things Better

PC USB Camera

USB
Compatible

World Standard PC (USB) Video Camera for true plug and play!

The ergonomic design of the camera allows you to position and point the camera in any direction you choose without having to hassle with adjustment handles. Just pick up the camera and you're ready to shoot.

The Philips PCA645VC features include:

- USB connectivity for true plug and play performance
- Full automatic control white balance, via USB the white balance can be controlled from the system
- Flicker free picture mode under 50 and 60 Hz light environment at each possible frame rate without any required actions from the user
- High frame rates: CIF up to 15 fr/sec, QCIF up to 24 fr/sec
- Integrated microphone and audio circuitry for live audio via USB
- A LED that shows the camera is active
- Windows98 WDM compliant driver software
- Video-mail application software



\$249

(71211)

Philips B201B 21" CRT



- Optional USB.
- Horiz. Scanning 30-107KHz
- Res. 1800x1350 @ 75Hz

\$2,290 (44852)

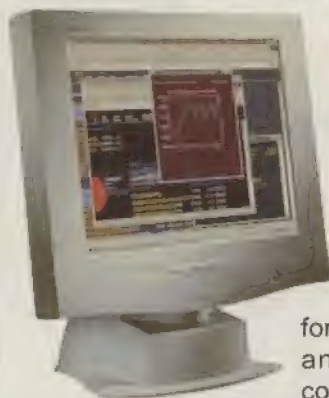
Philips B201P 21" CRT



- With USB & Multimedia Audio options.
- Horiz. Scanning 30-115KHz
- Res. 1800x1440 @ 75Hz

\$2,550 (45876)

Brilliance 15.1" LCD Monitor



\$1,990

The amazing Philips Brilliance 151AX TFT LCD XGA Monitor will make you question why you would buy a CRT Monitor.

This monitor is packed with features. For power users it has an option for a USB hub, with 4 downstream ports for easy connection of any device to your computer. With a super

15" viewing area, and a super tiny footprint, this monitor is perfect for any application. It has no Electro-Magnetic Emissions and complies fully with the EPA Energy Star Standards.

• Windows '98 compliant (22421)

• Small 17.6 cm (7 inch) footprint; weighs only 5.2 kg

• Display performance comparable to a 17-inch CRT monitor, with even better picture clarity and geometry

• No need for user geometry setting adjustments due to Philips advanced TFT technology



Philips Monitors 3 Year On-Site Warranty

Philips Australia provides a three year parts and labour on-site warranty to the original purchaser. A swap-out monitor will be provided to the customer within 24 hours by Philips.

MARCH

Page
24

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Philips Launches PC Peripherals

Speakers

DSS350 USB



DIGITAL MULTIMEDIA SPEAKER - Digital speaker innovation advances PC Multimedia audio and distinguishes digital CD sound quality.

- Plug in a pair and experience unequalled multimedia sound performance from your PC computer.
- Digital Audio - Signal to noise ratios of 98dB and sampling rates up to 55KHz.
- Hot Plug and Play - Offers easy operation through USB under Win98
- System Compatibility - Digital audio streaming under Win98.
- Superior Sound - Dynamic Bass Boost gives additional bass when needed
- Aesthetic Design - Powerful 2-Way 30-Watt speakers with one 4" bass driver and one 2" tweeter.

USB
Compatible

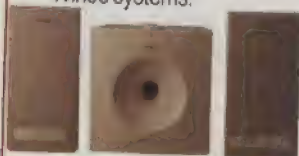
(72845)

\$225

IDEAL
for the
HOME

DSS370 USB

- Powerful combination of digital speakers and sub-woofer
- Super hi-fi audio reproduction through use of USB
- Signal to noise ratio up to 98dB and sampling up to 55KH
- Self Oscillation Class D Amplifier. No sound card required for Win98 systems.



Philips Speaker with
SubWoofer
(72847)

\$295

MMS130

- Active 2x3-watt (RMS) Speakers produce 80-watt PMPO
- Magnetically Shielded, eliminating unwanted distortion
- Convenient function controls, including a rotary volume control
- Small Footprint and stylish design blends with other equipment



Philips Analogue Stereo
Speaker MMS130
(72841)

\$49

MMS230

- Incredible surround and dynamic Bass Boost
- Active 2x5-watt(RMS) speakers give 120-watt PMPO
- Magnetically Shielded to eliminate interference
- Great for use with PC Computers, portable CD and Cassettes



Philips Analogue Stereo
Speaker MMS230
(72843)

\$79

MMS280

- MMS230 plus Active high power subwoofer
- Frequency range of 35-150Hz 30 Watt RMS, 60 Watt Music Power and 360 Watt PMPO



Philips Analogue Speaker
with SubWoofer
(72844)

\$175

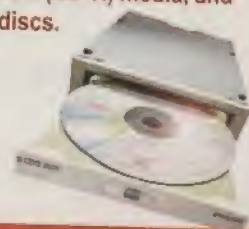
PCA350RW Internal SCSI CD-RW

- Internal CD-ReWritable Drive with SCSI-2 Connection
- Ideal for fast and cost effective production of audio CDs in low quantity
- CD-ReWritable discs store an amazing 650MB of information.
- Cost effective storage, backup, publishing and distribution features

All-in-one 6xCD-ROM 2x CD-Recordable and 2x CD-ReWritable - What you have always wanted is finally available. The internal CD-ReWritable PCA350RW allows you to play CD-ROMs and Audio CDs, record information on low cost CD-Recordable (CD-R) media, and write or rewrite to newly standardised CD-ReWritable discs.

Philips CD-Rewritable Kit
Internal
(72848)

\$629



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MARCH
Page
25

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and information

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It's your world. Be there.

Banksia Wave SP56 Dual

Catch the
V.90 Wave!

(46276)

\$245



The Wave SP56 Dual modem lets you fly through the Internet faster than ever before, as much as twice as fast as previous modems.

- ITU V.90 and K56Flex Dual Mode operation
- Smart answer phone
- SVD capable
- Hands free full duplex speakerphone with echo cancellation
- Upstream data transfer at 33.6Kbps, downstream data transfer up to 55.6Kbps
- 3 year parts & labour warranty, with lifetime support



Simple NetExpress 56



K56Flex & V.90 Data Fax Voice speakerphone SVD modem. Includes all you need to start exploring the World Wide Web!

(65858)

\$209



Zetafax

The most
advanced fax
software for
your PC network

Easier than using a fax machine and the faxes you send will be sharper. Saves time and money:

no more waiting by the fax machine. Zetafax **queues faxes** for sending and will **redial automatically** if the line is busy. Monitor faxes sent and received. Detailed **logs** for each fax indicate where and when it was sent. **View** or **print** received faxes. Supports all major operating systems. Includes client and server software. **Scalable. E-mail gateway** option.

Single User NT System

(24924)

\$209

5 User System

(36049)

\$769

Banksia MyModem 56V

Now with
SYMANTEC.
WinFax PRO 8.0

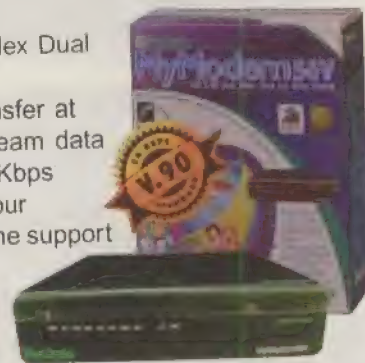
The reliable modem

The MyModem 56 Dual Mode V.90 and K56Flex modem is a high performance, low cost, easy-to-use modem for users who run PCs at home or in small businesses. It sends data at 33.6Kbps (receive at up to 55.6Kbps) and sends faxes at 14.4Kbps. It comes bundled with Windows fax and data software. And MyModem has now enhanced its business power with the addition of Symantec's WinFax Pro (OEM).

- ITU V.90 and K56Flex Dual Mode operation
- Upstream data transfer at 33.6Kbps, downstream data transfer up to 55.6Kbps
- 3 year parts & labour warranty, with lifetime support

(62589)

\$235



Banksia CommServer

Affordable remote access for
everyone in your business



CommServer CS410 is a communications and remote access server with an Ethernet connection designed to provide shared inwards and outwards communications over an office Ethernet LAN.

- Allows multiple users to concurrently access the Internet, send a fax or access remote data
- Simultaneously share up to **4** external modems with regular phone lines
- Start with one modem, add more later when needed.
- Dial-in remote access

4 ports (58577)

\$1,445

MARCH

Page
26

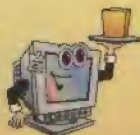
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NetComm



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Communicate with Netcomm

NetComm SmartSecurity Hardware Firewall



(70906)

\$3,550

- Protects a LAN from Internet hackers and intruders
- Active Web content filtering ensures that network users are protected from undesirable Internet information
- Easy to install and manage
- Separate ports for WAN, DMZ (Demilitarised Zone) and LAN

Internet security solution

Firewall

Web content filtering

Designed for small to medium-sized business networks, NetComm's SmartSecurity is the industry's most affordable Internet security solution and offers a powerful combination of firewall and Web content filtering.

It uses the latest third generation firewall technology, 'Stateful Inspection' which examines all OSI layers to either accept or reject the requested communication.

Stateful inspection is invisible to the users on the LAN and requires no client configuration.

In addition it supports numerous Internet protocols, including TCP and UDP which are required by applications such as DNS, DHCP and Real Audio.

NetComm Card Modem 56 Global/GSM

Now with
SYMANTEC.
WinFax PRO 8.0



Gives the world traveller the freedom of data connection either through a Land line or Mobile phone (GSM), with data download speeds of up to a scorching 56,000bps as well as the ability to send and receive faxes of up to 14,400bps. So no matter where you are - in a multitude of countries around the world, you'll always be in touch with the NetComm 56 Global.

- K56Flex, FLASH upgradable to new ITU standard V.90 via download from website.
- GSM ready (GSM connection kits sold separately, please call for information)
- Approved in 24 countries
- Nokia Approved

(30658)

\$419

NetComm Roadster II 56 USB

Now with
SYMANTEC.
WinFax PRO 8.0



Designed for Windows® 98

- Connect via Universal Serial Bus Port
- Powered by **USB**, no bulky power pack needed
- Features full voice capability with voicemail and handsfree speakerphone operation (headset included)
- Inbuilt SVD technology: Talk and send data at the same time over the same phone line

(63379)

\$259

Now with
SYMANTEC.
WinFax PRO 8.0

NetComm
CardModem
56



(52694)

\$309

NetComm
CardModem
56 Combo
Ethernet



(52693)

\$315

NetComm
Roadster II
56K V.90
Ultra SVD
Modem



(61194)

\$250

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And More.....

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Modems**
PCI 56K
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Modem
(72909)
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ISA 56K
Internal
Modem
(61675)
\$138

56K
VoiceDesk
Pro
External
Modem
(54361)
\$169

Credit
Card 56
PCMCIA
PC Card
(61678)
\$195



Special Back-to-School

Price of **\$179** (72430)

This fantastic package consists of:

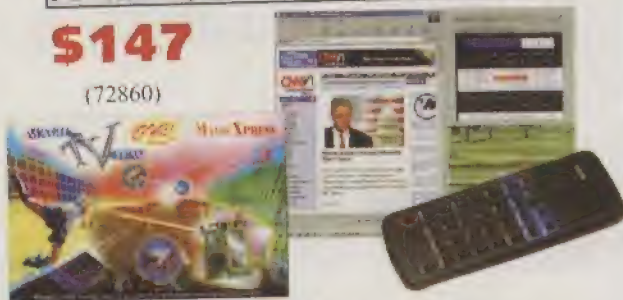
- **56k Voice/Data/Fax Modem**
fully featured Rockwell Chipset including
Dual mode (V.90 and K56Flex)
- **100 Hours Internet Access
Free with AOL**
- **1999 Australian Infopedia
with 4000 Internet Links**
35 Volume Reference Library



MAGIC TVIEW TV Tuner/Video Capture Card

\$147

(72860)



Watch TV on your PC

**Fully Featured, including Teletext and
Remote Control**

- ★ Watch TV on your PC in a resizable window, right up to full-screen (640x480), using the Remote Control.
- ★ Capture incoming video from a VCR, digital camera or CamCorder, then edit the captured digital data.
- ★ Capture still digital images, the Magic TView accepts input from Coax, RCA, SVideo and Internet Video cameras.
- ★ Move between Teletext pages instantaneously with a mouse interface, use multiple windows.
- ★ Video Conference with software such as Iphone & MS Netmeeting.
- ★ Windows 95/98 Compatible

PC To TV Box - Display PC graphics to TV

Corporate Presentations

Dynalink's PC-to-TV converter allows you to display video output from your PC on a big-screen TV set. Get the full-effect of your PowerPoint presentation, Web Site or demonstration via your large TV Screen.



(72861)

\$239

USB Products

USB Port Expander - Converts a single USB port on your PC into four USB ports. Avoid IRQ conflicts. Hot Plug and Play your USB devices.



(15939)

\$119

USB/Parallel Printer Cable allows you to hook up your standard parallel printer to a USB port. USB ports use only a single IRQ, no matter how many USB devices are installed on the system. Free up your printer port for other devices such as scanners.

(72900)

\$79

PCI-USB Port Converter Allows any PC to take advantage of USB devices. The card simply installs into a PCI slot and provides the PC with 2 USB ports. Windows 98 automatically detects the device and installs the appropriate drivers, no software required. Make your systems fully USB compatible.

(72910)

\$79

MARCH
Page
28

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3Com More connected.

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going to print so
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More connected with 3Com modems

3Com Megahertz® 10/100 LAN + 56K Modem PC Card



Today's easiest
combocard to
configure and use

(67217)

\$417

It practically sets itself up- including those mind-numbing drivers. It combines the world's leading Ethernet technology and the 3Com Megahertz 56K modem into a single PC card. It also delivers today's fastest 10Mbps connections with automatic 100Mbps network configuration when you're ready. It also offers 56K technology with the V.90 ITU-T standard built-in.

3Com Megahertz® 56K Global Modem PC Card V.90 56K



Hassle-free access and
high-speed downloads
anytime,
anywhere

(58084)

\$299

Delivers hassle-free access for global travelers and the V.90 56K standard for downloads up to 56Kbps worldwide. Features WorldPort™ country selection software to easily configure your modem for use around the world, Intelligent Auto Install for easy, doubt-free installation, and Digital Line Guard to alert you when connecting to potentially damaging digital or PBX lines.

NEW!

U.S. Robotics

3Com

56K Message Modem

\$279

(70929)



56K Professional Message Modem

(70928)

\$319

BOTH modems feature: Faster Internet access, Independent Voice Messaging (store incoming voice and fax messages with the computer switched off), Watch send & receive throughput change, graphically and digitally, in real time, Easier installation and use, Software upgradeable for future enhancements, Valued-added Connections CD-ROM Software.

The Professional Message Modem ALSO features: Caller ID, One-button access to voice messages, Built-in high quality speakerphone, V.80 (video conferencing) capable, Independent Fax Forwarding (forwards receiving faxes to a pre-specified telephone number, even when the computer is turned off).

U.S. Robotics

3Com

56K V.90 Voice Fax modem

\$239

(61303)



The 56K V.90 Voice Fax Modem enables an extraordinary increase in the transmission of data over normal telephelines at the price of a standard modem. Coupled with the added benefit of personal voice mail, a full-duplex speakerphone and fax machine, this is a reliable, easy-to-use, ultra-fast modem in one compact unit.

U.S. Robotics

3Com

56K Fax Modem

\$185

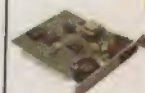
(63833)



(Pictured is
USA model)

This modem gives users faster Internet downloads for a more exciting, and rewarding on-line experience.

- Send faxes from within any Windows® application
- Send and receive while running other applications
- Delayed and broadcast sending
- Fax forwarding



Win-modem
56K V.90
Voice
Internal
Fax
Modem
for
Windows®

(66708)

\$180

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Includes V.90 56K standard & x2™ technology

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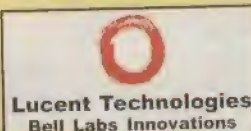
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MARCH

Page

29

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Data Fax Modems & Ethernet Cards

RealPort™ Integrated PC Card Family

The revolutionary RealPort Integrated PC Card family solves the number one problem mobile users experience with PC Cards today—lost, forgotten, or broken cable connectors and broken pop-out jacks. RealPort Integrated PC Cards provide robust and reliable communications by integrating connectors directly into the card. With RealPort Integrated PC Cards there are no cables and no hassles.

Xircom RealPort Ethernet 10/100 + Modem 56

The integrated PC Card: nothing to break, nothing to lose



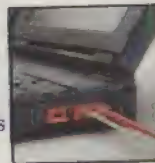
The RealPort Ethernet 10/100+Modem 56 combines 10/100Mbps Ethernet, 56K modem, GSM, AMPS cellular and ISDN connectivity, in a single cable-free Integrated PC Card solution. No custom cables to lose, no pop-out jacks to snap and leave you stranded. All you need are standard Ethernet and telephone connectors. GlobalACCESS™ features make it easy to connect to information from any location, anywhere in the world.



1. Slide into PC Card slot



2. Plug in standard LAN & phone connectors



3. Ready to access information in the office or on the road

(55838)

MiniDock™ Connector System

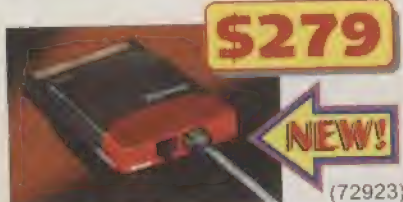
Combines both LAN and modem connectors in a single, durable device, enabling you to connect easily and reliably when accessing data from corporate networks, the Internet and other online services.



\$59

Xircom RealPort Value 56 Modem

High speed 56K modem functionality for notebooks. All connectors are integrated into the card providing a robust, reliable and easy-to-use solution. With no cables to lose and no moving parts to break, the RealPort Value 56 Modem will save you money with fewer support calls, less user downtime, and the elimination of the need for cable replacement.



Xircom RealPort Modem 56 GlobalACCESS

Offers mobile users high-speed 56K modem, GSM, AMPS cellular & ISDN functionality in a robust Integrated PC Card with built-in connectors. GlobalACCESS™ features make it easy to connect to information from any location, anywhere in the world. Flash ROM-upgradable to 56K (V.90) at no charge.



Xircom RealPort Ethernet 10/100

RealPort Integrated PC Card LAN solutions offer mobile users high-performance 10Mbps and 100Mbps Ethernet connectivity for the most reliable access to information while in the office. And it's easy to use!

- Robust integrated connectors
- Uses standard RJ-45 Ethernet cord
- Longer battery life
- Full-duplex Ethernet at 10Mbps



CreditCard 56K modem



(54763)

\$286

CreditCard 10/100 Upgradable



(27310) From

\$259 UTP

10Mbps Pocket Ethernet



(10257) From

\$559 Coax

Creditcard 10/100BTX Ethernet + 56K modem + Mini-Dock



(56359)

\$599

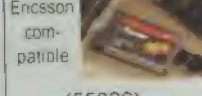
CardBus 10/100 Ethernet



(38605)

\$335

Credit Card GSM Modem



(55026)

\$395

MARCH
Page
30

Rent: Short or long term. Finance options available: IBM Easylease, AGC.



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Canon BJC-7100

Colour Bubble Jet Printer

(72294)

\$599



FAST !!

1200 dpi !!

- High resolution: Prints up to 1200dpi
- Up to 7.6ppm mono, up to 4.8ppm colour*
- Seven colour printing system produces 25 saturation levels per pixel on any medium, including plain paper
- PhotoRealism cartridge (BC62e) included
- Printing on plain paper is 99.4% water fast, colours are more vibrant and tones are sharper

Canon BJC-255SP

Colour Bubble Jet Printer

- Resolution: 360 x 360dpi
- Up to 3.4ppm mono, up to 0.52ppm colour*
- Optimises low resolution Internet images
- Gold standard photographic printing with optional PhotoRealism inks
- Super Economy mode for low-cost printing

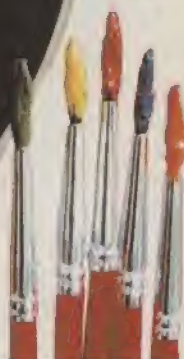


(61684)

\$159

IDEAL

FOR THE
HOME



Canon BJC-4310SP

Colour Bubble Jet Printer

- Super Economy Mode for low-cost printing
- Canon's Drop Modulation Technology™ delivers smoother colour gradations
- Use Canon's PhotoRealism inks for more colour combinations and virtually no pixelation
- Optional scanner head
- Super fast black & white: 4.5ppm*
- Banner printing: up to six A4 pages in length!
- Resolution: 720x360dpi



(68730)

\$239



*Approximate print speed

CanoScan FB320P

Flatbed Scanner



(68733)

\$196

- Only slightly larger than a sheet of A4 paper
- Spectacular image quality
- Comes with fun-filled photo-editing software
- Includes driver to convert your CanoScan into a photocopier!
- Parallel interface
- Maximum document size A4/Letter
- Selectable resolution: 25 to 2400dpi
- Optical Resolution: 300 x 300dpi



MARCH

Page

31

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Makes bright ideas look brilliant

More from EPSON

Black ink
cartridge
for Stylus
440/460

\$38

(70948)

Black ink
cartridge
for Stylus
740

\$46

(70091)

Tri colour
ink
cartridge
for Stylus
440/460/
740

\$45

(70092)

See the
Web Direct
Link for
others.

EPSON STYLUS COLOR 440



(67212)

\$245

- Excellent value, 720x720dpi photo quality printing for the home
- 4ppm black, 2.7ppm colour
- Ideal for printing colourful school reports, full colour banners, greeting cards, invitations, newsletters and much more
- User-friendly guide on CD-ROM

EPSON STYLUS COLOR 640



(67213)

\$319

- Superb 1440x720dpi photo-quality printing
- Brilliant 720x720dpi on plain paper
- 5ppm black, 3.8ppm colour
- Photo Enhance function automatically adjust brightness, contrast etc of your image

EPSON STYLUS COLOR 740



(67214)

\$489

- 1440x720dpi printing with Epson's Variable-Sized Droplet technology and Ultra Micro Dots
- 6ppm black, 6ppm colour
- Photo Enhance function
- Increased printable area
- Parallel & USB connectivity
- Ideal for the small office

EPSON EPL-5700 Laser printer

Networkable, speedy laser printing with MicroGray 1200 technology for finer detail. Compact enough to fit on any desktop. Up to 8 pages per minute print speed at 600 dpi resolution. 4MB memory standard. 50-200% zoom. Print layout and watermark functions. 100MHz CPU.

(65064)

\$895



EPSON PhotoPC 700 Digital camera

1.25 Megapixel CCD. 2x digital zoom. Complete exposure control. Internet ready image capabilities. Panorama auto-stitching for seamless 360° views. 10cm macro close-ups. Continuous shooting mode. Includes lots of image editing software.



(66204)

\$1,189

MARCH
Page
32

HARRIS

Rent: Short or long term. Several options available. Ask for Christine Dalton.



All prices include sales tax & subject to change w/o notice.

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Award-Winning Colour Printing

Tektronix Phaser 740L



Should I get a black & white
or colour printer?

Yes.

With the incredibly affordable Tektronix Phaser 740L colour-capable laser printer, the choice is easy. Start with a high-performance black & white printer. When you're ready, step up to colour by simply sliding in a few colour cartridges and you'll be printing in amazingly rich colour before you know it.

Colour-Capable
Laser Printer

(71835)

\$3,775

Tektronix Phaser 740



Never Say Never...

That is until it comes to making a choice between an affordable colour laser printer or one with extraordinary print quality. It's a compromise you'll NEVER have to make with the Tektronix Phaser 740 colour laser printer. For breathtaking images that leap off the page, at a breakthrough colour laser price, look to the Phaser. That way, you'll never have to compromise. Never.

Colour
Laser Printer

(71836)

\$4,895

- Print size A4
- 10BaseT for network-ready printing right out of the box
- No developers or other special components that need regular service
- Adobe Postscript 3
- Optional automatic duplexing



Full colour printing

Max resolution black colour
Memory standard max

Image processor

Print speed black colour

Pipeline printing

Duplex manual auto

740L

740

add colour kit

standard

1200dpi

1200dpi

-

600dpi

16MB

32MB

256MB

256MB

133MHz

133MHz

16ppm

16ppm

-

5ppm

optional

optional

standard

standard

optional

optional

For
Tektronix
Phaser 740:

Black toner
(6,000 pg)
(71854)

\$180



C,M or Y
toner
(71855,
71856, 71857)

\$359

High
capacity
black toner
(12,000 pg)
(71858)

\$265

16MB
memory
(71844)

\$439

32MB
memory
(71845)

\$875

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coated
paper (100
sheets)
(71879)

\$218

Extra 1 year
on-site
warranty
(71852)

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lasers! From
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(23071)

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Slide adapter.

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INTERFACE**

\$749

(66184)



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with OEM
ADOBE
PHOTOSHOP
5.0 !!

\$1,325

(71635)



Scanjet 6250C
with OEM
ADOBE
PHOTOSHOP
5.0 !!

\$1,497

(71636)



Scanjet 6250C
with
Omnipage
Pro 9.0

\$1,190

(70707)

HP Scanjet 3200C

Best Value for home

- 600dpi optical, 9600dpi enhanced
- HP PrecisionScan LT OCR software, Adobe PhotoDeluxe 2 included
- Parallel port
- 30-bit image processor

NEW



Call for pricing
or check Web
Direct Link

HP ScanJet 5200C

Highest productivity for business

- 600dpi optical, 9600dpi enhanced
- HP PrecisionScan 2.0 OCR software, Adobe PhotoDeluxe Business edition, Caere PageKeeper Standard, On-line email & Web Task software
- ScanJet copy utility
- USB and Parallel

**USB &
PARALLEL**

NEW



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Direct Link

HP Scanjet 4100C

The easiest scanner for home

- Guided workflow for quick results.
- One-touch scan and copy buttons.
- Easy to set up and fast operation with USB.
- Resolution: 600dpi Hardware Super Sampling, 1200dpi enhanced.

**USB
INTERFACE**

(67196)

\$296



HP Scanjet 6250C

Best image quality for professionals

- A powerful networkable scanner
- Resolution: 1200dpi Hardware Super Sampling, virtually unlimited enhanced resolution
- USB/SCSI capable
- Integrated automatic document feeder

**USB &
SCSI**

(66185)

\$939

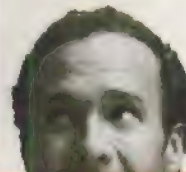


Features of Intelligent Scanning Technology

	3200C	4100C	5200C	6250C
Push button scanning		✓	✓	✓
Dual image scanning	✓	✓	✓	✓
Auto descreen/deskew	✓	✓	✓	✓
Integrated OCR	✓	✓	✓	✓
36-bit colour image processor		✓	✓	✓
Scan direct to application (drag & drop)		✓	✓	✓
Line art enhancement			✓	✓
Preview outline by region type			✓	✓
Auto page format retention			✓	✓
HP PrecisionScan LAN for network sharing				✓
Intelligent Assistance				✓
Unlimited enhanced resolution				✓
Advanced imaging controls				✓
35mm slide scanning				✓

**HP
Scanning
Technology
at a glance**

It does the
thinking for
you!



HP DeskJet Printers

Have a look at www.ht.com.au/cat/hp
for HP inkjet papers, transparencies,
inks, toners etc.



HP DeskJet 695C

Easy to use -
great quality

- HP PhotoREt Technology
- Dual cartridge
- ColorSmart II
- New improved driver - Windows 3x/95/NT 4.0
- Photo capable with optional Photo Head
- New super economy mode
- Black: 600x600dpi, 5ppm
- Colour: 600x300dpi, 1.7ppm



(66260)

\$259

HP DeskJet 710C



Do you dream
in colour?

- HP PhotoREt II Technology
- Black: 600x600dpi, 6ppm
- Colour: 600x300dpi, 3ppm
- 100 sheet paper tray
- Quiet operation
- Photo-quality colour for home or office
- Handles many types of paper

(68905)

\$335

HP DeskJet 880C

Super-fast,
stunning print quality
on plain paper

- HP PhotoREt II Technology
- Black: 600x600dpi, 8ppm
- Colour: 300x300dpi, 5ppm
- Poster and n-up printing
- USB and parallel interface
- Black text more crisp and laser-like than ever
- Photo-quality colour

NEW



(72920)

\$569

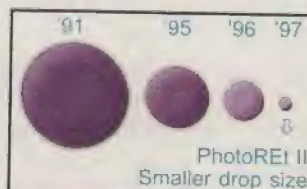
**USB &
PARALLEL**

What is PhotoREt II?

Over the last several years, dots per inch (DPI) has become one of the specs people associate with print quality. But higher DPI doesn't necessarily equal better print quality. There are drawbacks to increasing dots per inch, including bigger file size, slower print speed and less control of the ink on plain paper. All those drops of ink can make plain paper wet and wrinkled. But there is an alternative. The new HP printers feature a breakthrough HP technology known as PhotoREt II. It maximizes efficiency of the new HP colour inkjet cartridge to fire ink drops that are 70% smaller than those of previous cartridges, and the smallest dots yet compared to other desktop inkjet printers. It allows the cartridge to place up to 16 drops of ink on a single pixel, producing more colours per printed dot.

What does this mean for your print-outs?

You will get vivid colours, smoother skin tones, less graininess, sharper edges, smoother colour transitions and better image resolution on plain and special paper, without sacrificing print speed.



PhotoREt II..
Preferred by most
advanced life
forms



HP DeskJet 1120C

PhotoREt II
600x600dpi,
6.5ppm black
600x300dpi,
4.5ppm colour
Network ready
Prints up to A3
size

A3

\$837

(56298)



HP DeskJet 895Cxi

It's fast!

PhotoREt II
Networkable
10ppm black
6ppm colour

**USB &
PARALLEL**

\$790

(70705)



HP Laser Printers

Visit the Web Direct link for
HP papers, toners etc.

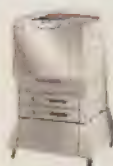
COLOUR



HP Colour LaserJet 4500

16ppm mono
4ppm colour
32MB RAM
standard
HP PCL5/
PS2
(70356)

\$5,589



HP Colour LaserJet 8500

24ppm mono
A4, 6ppm
colour A4,
3ppm colour
A3.
600x600dpi,
32MB RAM.
(70355)

\$13,780

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right HP
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HP LaserJet 2100 Series

HP introduces three
great new laser printers
that offer excellent
performance, expanda-
bility & flexibility, and
superior value.
1200dpi, 10ppm.
60MHz processor, 350-
sheet paper capacity,
15,000 page monthly
duty cycle.



LaserJet 2100

A fast flexible laser with
room to grow.
(4MB RAM, EIO, PCL 6)

(72291) **\$1,440**



LaserJet 2100M

A fast flexible laser with
PS and PCL.
(EIO, PCL 6, 8MB RAM)

(72292) **\$1,599**



LaserJet 2100TN

A complete network printer.
(EIO, PCL 6, 8MB RAM,
additional 250-sheet paper
tray, HP JetDirect print
server installed)

(72293) **\$1,945**



HP LaserJet 1100 Printer

The 600dpi print resolution with HP's Resolution
Enhancement technology (REt) makes every document
more professional. Network compatibility available. HP's
exclusive JetPath technology allows you the flexibility to
expand the HP LaserJet 1100 printer into an All-in-One
performer when your business needs grow.
8ppm print speed. 2MB RAM.

(70095) **\$789**

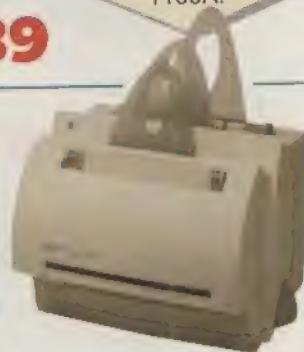
If your current
business needs
require the HP
LaserJet 1100 with
copying and
scanning
capabilities, move
up to the LaserJet
1100A.

HP LaserJet 1100A Printer - Copier - Scanner

Offers printing, copying and scanning All-in-One. In addition to crisp, sharp laser
printing, you can make laser copies at the touch of a button, even without the PC
turned on. Full scanning capability enables you to transform hard-copy documents
to electronic images to work with on the desktop, file, or communicate via e-mail
and PC fax.

Scan resolution 600dpi enhanced, 300dpi optical.

(70096) **\$969**



HP LaserJet 4000

- 17ppm, 100MHz RISC
- HP PCL6 & PostScript level 2
- 1200 dpi
- 600 sheet standard input
- 4MB RAM
- Warm up time less than 15 sec.

From **\$2,168** (54375)



HP LaserJet 5000

A3

- 16ppm, 100MHz RISC
- HP PCL6 & PostScript Level 2
- 1200dpi
- 250-sheet input tray
- 4MB RAM (exp. to 100MB)
- Print size up to 11x17" (A3)

From **\$2,749** (60548)



HP LaserJet 8000

A3

- 24ppm, 133MHz RISC
- HP PCL 6 & PostScript Level 2
- 1200dpi
- 2 x 500-sheet input tray
- 16MB RAM (exp. to 192MB)
- Print & duplex up to 11x17" (A3)

From **\$4,790** (60551)



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The HP "All-in-One" Series

HP OfficeJet 710 *Prints, faxes, scans & copies all in colour*



(71269) **\$969**

NEW!

That's right - it even sends and receives colour faxes with other compatible colour fax machines. You can even scan and send colour documents to anyone with an email address. It's communicating made easy with colour faxing and scan-to-email.

Print: Brilliant colour with HP PhotoREt and optional photo cartridge. Up to 5ppm black, 2ppm colour. **Fax:** Full-featured plain paper fax, plus colour fax. PC not required for black & white faxing. PC-assisted colour faxing to and from other colour fax machines. Speed dialing and automatic redial. **Scan:** Makes it easy to add photos to your emails or other Windows applications to jazz up your projects. **Copy:** Saves trips to the copy center. PC not required for black & white copies.



HP LaserJet 3100

Printer, fax,
copier,
scanner.
Print:
600x600dpi,
6ppm.
Fax: 6 sec.
per page,
175

programmable
speed dials.

2MB
memory.

Scan/Copy:
600dpi
enhanced.
zoom 50-
200%.

\$1,369

(58566)

HP OfficeJet 635 *It's a fax, a colour printer, colour copier, and colour scanner!*

Completing your work in colour is now convenient and easy. The HP OfficeJet Series 600 prints, scans and copies in colour, making it simple to impress customers or clients. Plus it's a plain paper fax. You get four essential office devices in one powerful package! **Print:** 600x600dpi and up to 5ppm black, 600x300dpi and 2ppm colour. **Fax:** Fast, full-featured plain paper and PC faxing. 20-page automatic document feeder for unattended faxing. 100 speed dials. Large multiple-page memory. Automatic 5x redial. **Scan:** 300dpi optical, 1200dpi enhanced. Includes OCR software. **Copy:** Reduce, enlarge or make full-size multiple colour copies. Up to 99 copies from one original. Makes B&W copies independent of the PC after setup.



NEW LOW PRICE

(55544) **\$790**

HP OfficeJet Pro 1170C / 1175C *Print, copy, scan, all in colour!*

Features PhotoREt II



From
(63098) **\$1,375**

The easy to use All-in-One that provides professional quality and performance for the discerning customer.

Print, copy, scan, all in colour!

Both OfficeJets feature a versatile flatbed that lets you easily scan and copy a wide variety of documents, pictures, books and other objects. They print 9ppm black, and 5ppm colour. Copying is made easy with super-zoom, auto-enlarge, poster, mirror and clone features.

The 1175C model also includes integrated PC faxing and has a 30-page automatic document feeder for unattended copying or scanning.

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Leading Disaster Recovery

Seagate Backup Exec

From the developers of the utilities that Microsoft ship with NT 3.51, NT 4.0 & soon NT5

Key Features

Intuitive User Interface

wizard driven solution to make even the most complex backup routines and operations simple and easy to use, even for an inexperienced operator

Integrated Virus Control

scans and cleans files prior to being backed up. Includes FREE updates for life and monthly reminders to download most recent virus signatures.

Schedule backup Jobs Microsoft Compatible

for unattended backup operations
from the developers of the utilities that ship with NT 3.51, NT 4.0 and NT 5.0 - reads MTF (Microsoft Tape Formats) for simple migration from the NT applet.

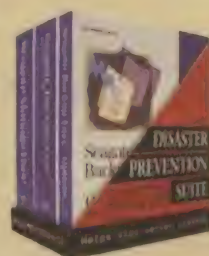


Disaster Recovery Suite

Rebuild a crashed NT server in minutes Vs hours using 4 diskettes and your last backup tape. Includes Backup Exec for NT v7.2 and Seagate Software IDR (Intelligent Disaster Recovery)

\$1,629

Product code: SBE-NTSE-DPS1 (72882)



Disaster Prevention Suite

Helps stop server crashes using proactive server monitoring. Integrated trend analysis enables fast problem resolution. Rebuild a crashed NT server in minutes Vs hours and includes a copy of the world's leading Backup Solution for NT.

\$2,980

Product code: SBE-NTSE-DPS2 (72884)



High Availability Suite

For companies with mission critical data who can not afford to loss data between the last backup and a server crash. The ultimate in data protection. Includes 2 x Replication Exec, 5 x Manage Exec (server monitoring), 1 x IDR and Multi-server version of Backup Exec for NT.

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Product code: SBE-NTMS-DPS3 (72885)



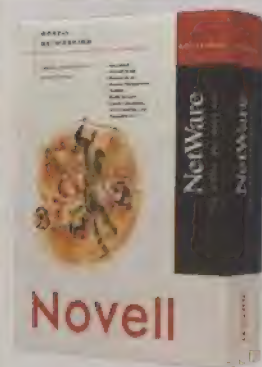
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Novell® NetWare. 5

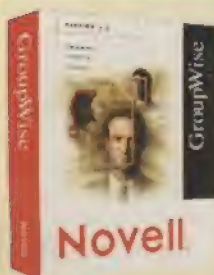
NetWare® 5 is the #1 network for Internet-enabled businesses. Through NDS, it provides centralised management of entire heterogeneous networks, from applications to the Internet-delivering an average 69 percent savings in administrative costs over non-

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smart
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quickly

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efficiently

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professionals

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The Experts Choice



(67223)

\$168

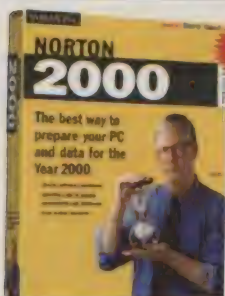
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5 powerful utilities to fix and prevent PC problems

Norton SystemWorks™ is the first fully integrated, comprehensive utility suite, comprised of five award-winning Symantec products, plus a Bonus Pack. They work together to both fix and prevent system problems. **Norton AntiVirus™ 5.0** offers the world's most popular and most powerful anti-virus capabilities. **Norton Utilities™ 3.0** is the industry leader in fixing and preventing computer problems. Remove unnecessary files with **Norton CleanSweep™ 4.5**. **Norton CrashGuard™ 4.0** protects against system crashes and screen freezes. And **Norton Web Services™** gives you easy access to the latest virus definitions, hardware drivers, and software updates.

The Bonus Pack includes Norton 2000™ to make your PC and data "millennium ready", Norton Mobile Essentials™, WinFax™ Basic Edition and Symantec Visual Page™.

Now with
BONUS PACK
worth \$500



(70217)

\$65

NEW

Norton 2000

Save your valuable pc and data from Year 2000 crises! Norton 2000 finds potentially damaging dates in spreadsheet and database data. Tests and fixes system BIOS and clocks. Checks desktop applications for Y2K compliance. Automatically updates database of Y2K-compliant software. Supports central installation administration.

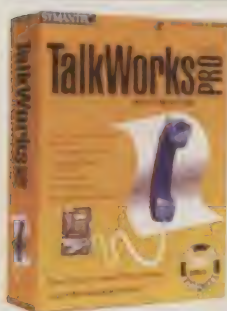


(67197)

\$84

Norton AntiVirus 5.0 Gold

The #1 anti-virus software in the world. Keeps your computer safe from viruses that might come in from e-mail attachments, floppy diskettes, Internet downloads, software CDs, or a network. It can be scheduled to automatically retrieve new anti-virus definitions from Symantec.



(67203)

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(67201)

\$134

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Norton Ghost



The fast PC cloning solution. Reduce PC roll out and upgrade times by 90%! Call for licencing info and pricing.

pcANYWHERE™ 8.0



(52653)

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Norton Utilities Gold



(71278)

\$129

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(58206)

\$150

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- * **First Aid 98** - Fixes Windows problems automatically

- * **Hurricane v3** - Speed-enhancing tools to boost program launch times
- * **Uninstaller v5** - clean up your hard drive.
- * **Oil Change** - Scans computer for installed software/hardware, lists new updates/drivers available on the Internet.
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#1 in Virus Detection and Removal. Stop viruses before they stop you!

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McAfee 2000 Toolbox gives you overall PC protection, right now: Virus protection, backs up critical system regions and helps get your system up and running in case of a disaster, monitors your system, alerts you to potential problems etc.

MARCH

Page
42

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WinDelete 97

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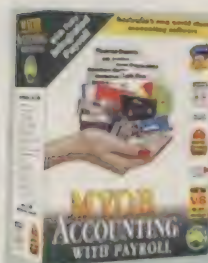
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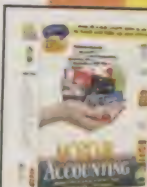


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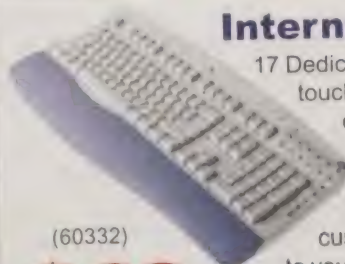


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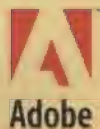
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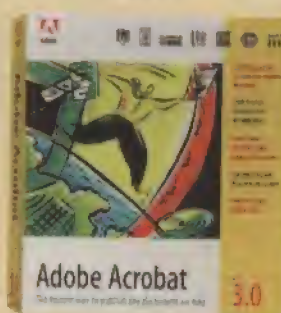


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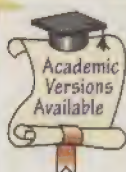
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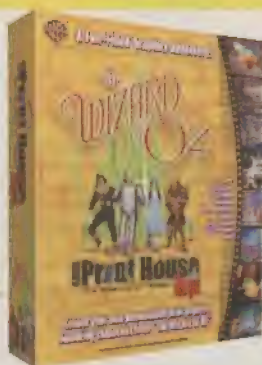
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MARCH
Page
46

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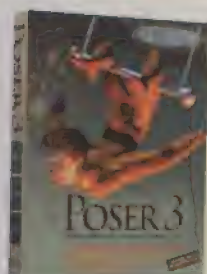
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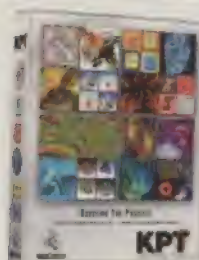


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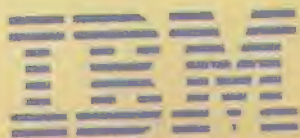
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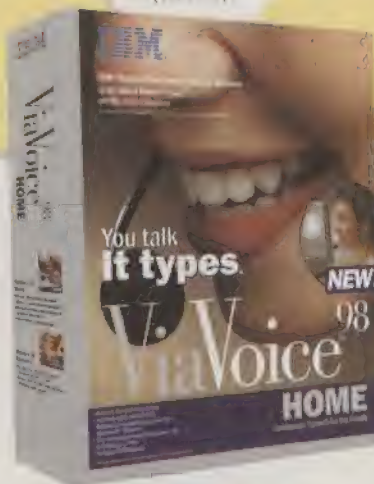
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Page

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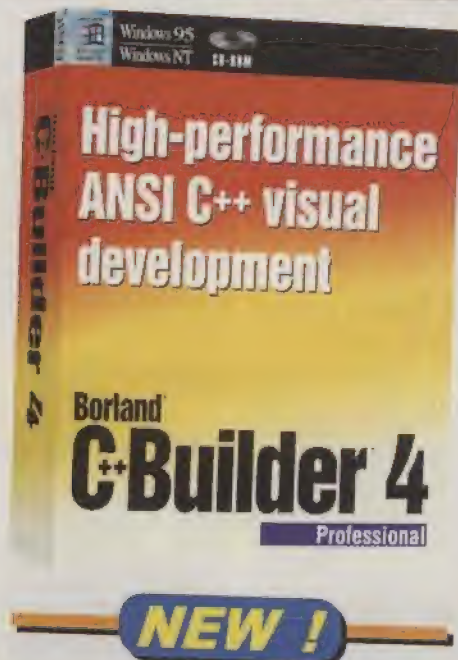
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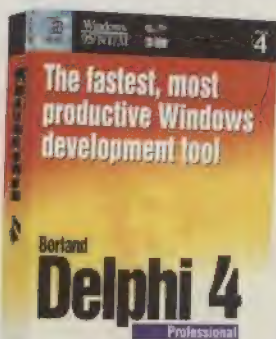
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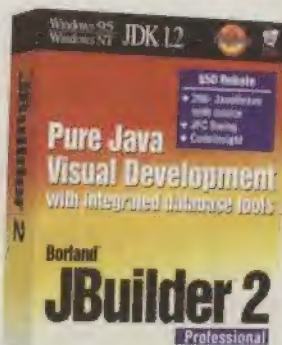
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Page
50

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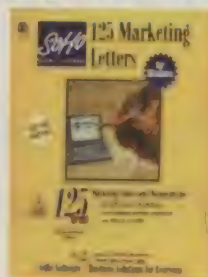
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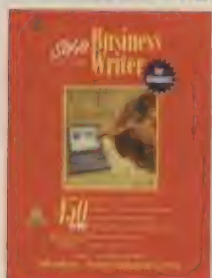
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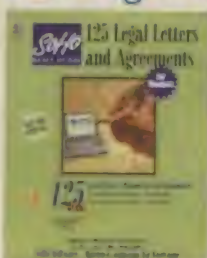
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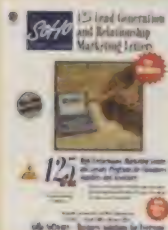
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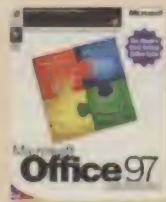
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Windows NT Workstation



Office 97



Office 97 Pro

MARCH

Page
52

HARRIS

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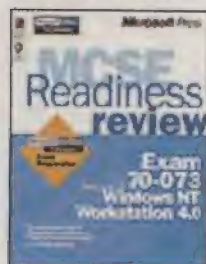
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available, subject to approval

MCSE Readiness Review Series



The new Microsoft Press Readiness Review books and CDs help users practice answering MCP exam questions - sharpening their test-taking skill and identifying areas for further study. Randomly generated practice tests on CD deliver questions that map to actual MCP exam objectives. Users can test and retest with different question sets each time. The companion text offers points for understanding correct and incorrect responses, along with valuable test-prep suggestions to shore up performance.

EXAM 70-073 MICROSOFT WINDOWS NT WORKSTATION 4.0



Each time a user logs on to the title's CD, a new set of Windows NT Workstation questions are asked. If a question is answered incorrectly, the program directs

the reader to corresponding sections of the companion book to study. Skills assessed include Windows NT Workstation installation and configuration, managing resources, and daily monitoring of the system.

(73159) **\$55**

EXAM 70-067 MICROSOFT WINDOWS NT SERVER 4.0

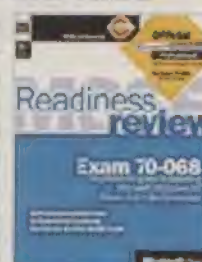
Like all titles in its series, this book-and-CD training resource administers practice exams that allow users to assess strengths and weaknesses and familiarize with the real exam's format and objectives. Plus the CD program points users to relevant areas of the book in response to incorrect answers. Topics covered include installing Windows NT Server, monitoring the system, and configuring a Windows NT Server network. An ideal companion for MS Windows NT Administration Training and MS NT Technical Support Training.



(73160) **\$55**

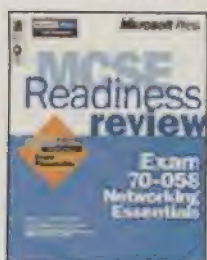
EXAM 70-068 WINDOWS NT SERVER 4.0 ENTERPRISE

To become experts, IT professionals turn to the MCSE exams. This book-and-CD resource enables IT professionals to gauge their exam readiness before they take the real test. The title's CD-based testing tool randomly generates a set of 60 questions from a comprehensive field of hundreds, so users can test themselves with several different exams. It's an efficient, low-cost way to judge Windows NT skill level.



(73162) **\$55**

EXAM 70-058 NETWORKING ESSENTIALS

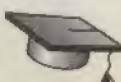


This innovative self-assessed tool focuses on the core technologies surrounding networking, including MS Windows NT Server, the Internet, and intranets. Provides personalised practice exams that cover objectives included in the real exam, plus it directs readers to the appropriate sections of the book to study. Creates a personalised 60-question practice exam that assigns at least 3 questions per exam objective.

(73158) **\$49**

EXAM 70-098 MICROSOFT WINDOWS 98

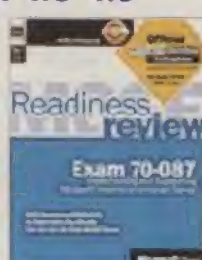
One of the newest additions to the innovative Microsoft Readiness Review series. This unique book-and-CD tool allows exam candidates to determine their readiness for the Windows 98 exam - before they take the real test. This is one of the only real preparation resources that tests users with real Microsoft Windows 98 exam questions. MCSE Readiness Review Exam 70-098 Microsoft Windows 98 also makes an excellent companion for the Microsoft Windows 98 Training Kit.



(73163) **\$55**

EXAM 70-087 MCSE READINESS REVIEW IIS 4.0

Covers important skills such as choosing and implementation strategy, configuring IIS 4.0 for various Internet services, security issues, and more. Administers practice exams based on the real exam's format, plus it directs users to relevant areas in the book when answers are incorrect. Works in conjunction with the Microsoft Internet Information Server Training Kit.



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MARCH
Page
53

Home Software Titles

FEATURE PACKED



Family Tree Maker 5 Basic 4CDs

Four CDs full of information. The easiest and most complete resource for building your family tree. Access to 750 million names. Birth, marriage, death records index and more. Form letters to request records in multiple languages. Exclusive Internet tools to search millions of genealogy web pages. Record all source information. Make professional looking printouts of your results. Publish an Internet Family Book, and heaps more. Why trust your family history to anything less?

(68686)

\$60

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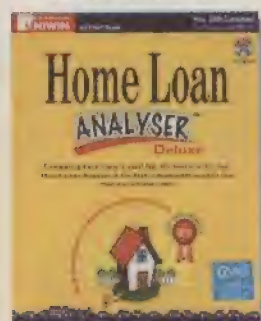
This Deluxe 10-CD set also includes:

- World Family Tree™ (50 million names, 75,000 family trees)
- U.S. and International Marriage Records Index (1560-1900)
- 6-month membership to Genealogy Library.com

(68688)

\$199

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(72442)

\$49

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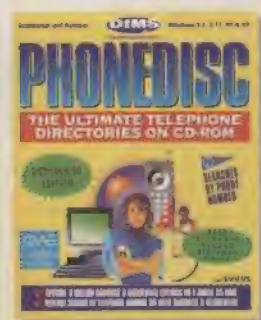


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(70354)

\$19

Australian PhoneDisc

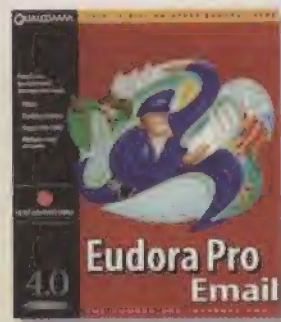


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(70353)

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Eudora Pro 4.1

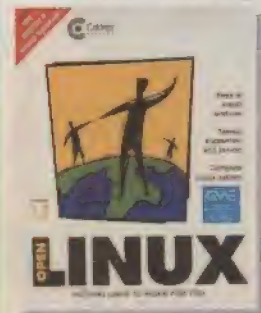


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(72061)

\$79

Caldera OpenLinux Base 1.3



An alternative to operating systems such as UNIX® and Windows NT®. Multi-user, multi-tasking. 32-bit power. KDE Desktop and Sybase® Database. Enhancements for version 1.3 include: improved install, updated Linux kernel 2.0.35, multi-lingual manual, easy connection to Internet providers, self hosting release, Year 2000 compliant NetWare client, PalmPilot capability.

(70341)

\$86

RedHat Linux 5.2



A complete computing environment in one box. Because of the wide variety of software that is included in Red Hat Linux, you can use it as a server or desktop at work or at home. Changes from previous version: simplified installation, multiple SCSI support during install, now includes Apache 1.3 & Gimp 1.0, 2.0.36 kernel, Linux 2.2 ready, updated PCMCIA & sound support.

(70344)

\$99



All new acceleration for your PC!

Sonic Impact S90

Hot 3D Wavetable Audio!



(69486)

\$110

Diamond's Sonic Impact S90 uses advanced A3D technology to bring life-like positional 3D game play to your PC. Sonic Impact S90 includes hardware acceleration for 64 wavetable voices and Aureal's A3D to immerse you in the middle of the action. Add realistic atmospheric effects, including fog and underwater sounds, and you have total audio transformation for your PC.

- PCI design for faster system performance
- 64 Hardware wavetable voices
- Supports downloadable samples
- Runs with DOS, Win95/98, Win NT 4.0

Monster Fusion

2D and 3Dfx acceleration on one card

Monster Fusion combines 16MB of 3D gaming power with fantastic 2D graphics acceleration, all in a single card. Diamond has built on 3Dfx's Voodoo Banshee technology to deliver 1920 X1440 resolutions and 60+ frames/second game play. Yes, it's Fusion Time, baby!

- Available in PCI and AGP configurations
- Supports Glide, Direct3D and Open GL API's

(68381)

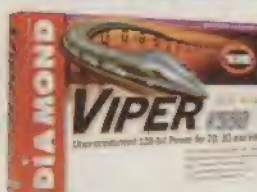
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Explosive software bundle in special retail packs!

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The Next Generation!



Looking for the most powerful graphics card on earth?

Diamond's next-generation Viper V550 combines 16MB of fast SDRAM, a breakthrough dual-processing architecture and hardware OpenGL acceleration to deliver workstation levels of 2D and 3D power, lightning-fast 3D game play and support for software DVD. Available in PCI and AGP 2X configurations.

- 128-bit dual processor architecture
- OpenGL and DirectX acceleration
- Software DVD support (AGP)
- Hot software bundle
- 16MB of SDRAM

(66530)

\$352



Monster Sound MX300

Ultimate 3D Audio Experience!!!

NEW

Want to annihilate your opponents every time? Diamond's Monster Sound MX300 delivers awesome combat tools: Aureal's latest A3D 2.0 positional audio, 4-speaker support and 64-voice hardware wavetable synthesis. Imagine playing your favourite PC game hearing footsteps from behind you and gun shots from overhead. Monster Sound MX300 delivers unbelievable 3D effects to give you the unfair advantage.

- Hardware A3D 2.0 Acceleration
- Accelerates up to 96 hardware streams
- Advanced 320-voice wavetable with support for downloadable samples
- Supports DOS and Windows games

(70214)

\$159



Rio PMP300

Internet Music in the Palm of Your Hand!

The first portable MP3 music player that stores up to 60 minutes of digital-quality sound. Load the latest songs onto Rio directly from your Hard Drive, personal CDs or the Internet and carry them with you. It's smaller than an audio cassette and has no moving parts, so it never skips. Powered by a single AA battery, Rio provides up to 12 hours of continuous music playback.

- Lightweight: only 70 grams
- Palm size for easy portability
- 32MB built-in flash memory

(70854)

\$458



HomeFree Easy Wireless Networking!

No holes! No cables! HomeFree delivers 1MB wireless links for up to 16 PCs, 45 metres apart.

Includes point-and-click network setup, software for shared Internet access, all at an incredible price. Windows 95/98 only.

- Frequency hopping for maximum security
- 45-metre range
- Each kit contains 2 nodes

Desktop Pac: 1 ISA / 1 PCI

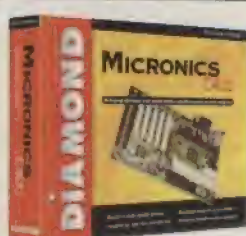
Combo Pac: 1 ISA / 1 PCMCIA

(70218)

\$439

(70219)

\$499



Micronics C400

The Ultimate Multimedia Platform

NEW

Diamond's Micronics C400 motherboard is the perfect platform for your ultimate multimedia system. Featuring Intel's 440BX AGP set, it supports Pentium II and Celeron processors up to 450MHz, Ultra DMA/33, USB, IR communications and advanced system monitoring features. For your totally accelerated PC, start with the best!

- Legendary Micronics quality & performance
- 5 PCI slots (1 shared)
- Award BIOS on 1MB flash

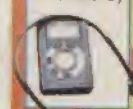
(70619)

\$262

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MARCH

Page 55

HP SureStore CD Writer

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The HP SureStore CD Writer family offers the latest CD-ReWritable technology available

NEW!

HP SureStore 8100i Internal



(66428)

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Media

(73182)

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software, 30
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and CD Inlays

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HP SureStore 7200



HP Surestore 7200i
IDE Internal (57293)

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- Premium Performance
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HP Surestore 7200e
Parallel External (71618)

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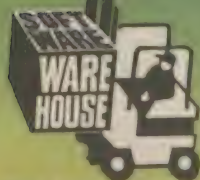
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March 1999 Issue



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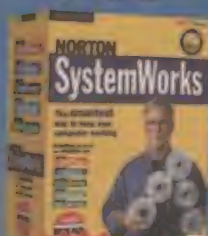
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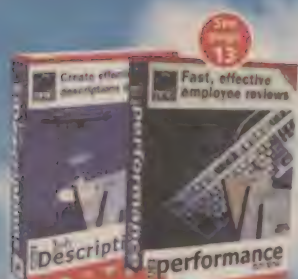


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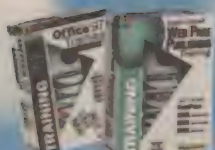
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A-Z INDEX

3Com	40,45,47
Adobe	19
APC	46
Autodesk	24
Banksia	44
Caere Corporation	34
Canon	6
Compro	40
Corel	17,23
Diamond	42
D-Link	47
Dragon Systems	14
DtMS	27
Epson	6
Extensis	18
Filemaker Inc.	16
Greenwich	
Mean Time	33
Hauptpage	43
HP All-In-One	35
HP Networking	47
HP Notebooks	4
HP PC's	5
HP Printers	7
HP Scanners	35
HP Storage	38
IBM	14
IMSI	15,22,25
Intuit	10
Iomega	39
JASC	21
Kiss Co	41
Kodak	40
Logisoft	10
Logitech	40
Macromedia	20
MAUS	13,31
McAfee	28
Meta Creations	20
Microsoft	3,8,9
Microtek	36
Millenium Buster	32
MYDB	11
NetComm	44,45
Pinnacle Systems	43
Powerquest	30
QuarkXpress	18
Quidos	16
Seagate	37,46
SmithMicro	41
Sony	38,40
SupportNet	10
Symantec	26,29
Travelling Software	27
Umax	37
ViaGrafix	12
Vision	24
Beyond 2020	40,42
WebCentral	41
Winzip	31
Xerox	26

Introduction

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Hello, and welcome to March Madness at International Software Warehouse! Once more we bring you pages of top deals, all at the best prices. The fork lift truck logo is your guarantee of our commitment to value. Each month we negotiate with our suppliers to get fantastic offers out to you. If there is anything you would like to see more of, email me on feedback@iswh.com.au

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Phil Webb
Managing Director



MARCH MADNESS

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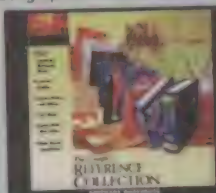
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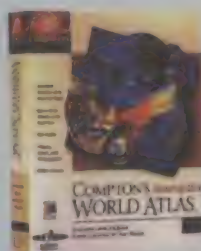
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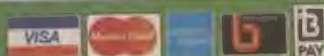


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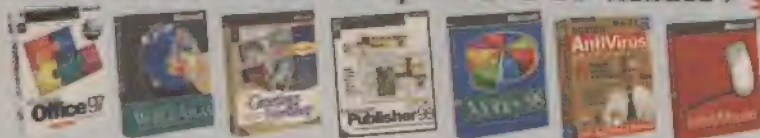
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Developer	MIC30 \$1239	\$Call

Please note: Office 97 is ONLY available on CD. This upgrade is available via Microsoft CD - a small charge.

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- **Access 97:** Seamlessly integrates with the Visual Basic custom development environment, to enable powerful, bespoke business application to be constructed within the Office 97 Pro environment.
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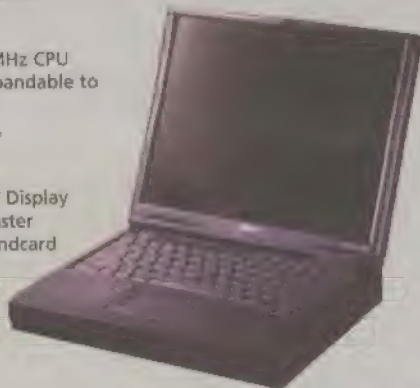
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- 1.44Mb FDD
- 12.1" SVGA TFT Display
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- Windows 95



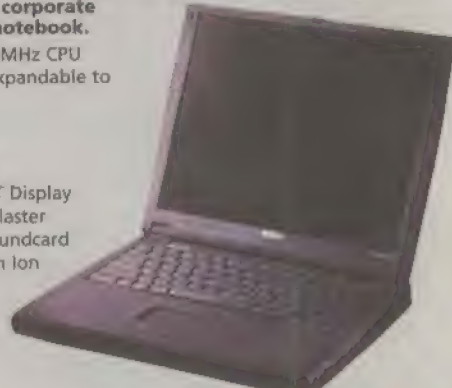
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HPN013

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The HP Omnibook 4100 has the advanced processor and display performance of a desktop PC in a thin, lightweight and easily expandable portable package. It really is the corporate performance notebook.

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- Win 95



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HPN015

THE OMNIBOOK FAMILY

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HPN015	Pentium II 266MHz	32Mb	6.4Gb	24x	14.1" TFT	Win 95	3 year	\$6,249	OB 4100
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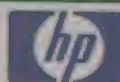
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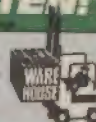
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- Win 98
- 3 year warranty

- 33.6k external modem
- 100 hours of free AOL time

OfficeJet 590

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- On board Audio
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- 32Mb RAM
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- Win 98
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- Win 98
- 3 year warranty

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- 4Mb SGRAM graphics card
- 3COM 10/100TX remote wakeup network card
- Win NT4 workstation licence + Win 95 on CD
- HP Top Tools software

Excludes Monitor

HP Vectra VE8 350 HPV002 **\$2499**

HP Vectra VE7

- Intel Celeron A 333MHz CPU
- 32Mb SDRAM
- 3.2Gb Ultra ATA HDD
- 2Mb AGP graphics card
- 3COM 10/100TX remote wakeup network card
- Win 95

Excludes Monitor

HP Vectra VE7 HPV001 **\$1849**

HP Vectra VE8 400

- Intel Pentium II 400MHz CPU
- 64Mb SDRAM
- 3.2Gb Ultra ATA HDD
- 4Mb SGRAM graphics card
- 3COM 10/100TX remote wakeup network card
- Win NT4 workstation
- HP Top Tools software

Excludes Monitor

HP Vectra VE8 400 HPV003 **\$2749**

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An outstanding combination of print quality and performance



This latest state-of-the-art technology meets the demands of the power colour user. By combining EPSON's new Variable-Sized Droplet technology and Ultra-Micro Dots with EPSON's PerfectPicture imaging system, the EPSON STYLUS COLOR 740 has created a new standard of image quality for the SOHO environment.

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- Ability to produce true 1440 x 720 dpi printouts even on plain paper means you can include eye-catching colour charts and graphics in all printed material.
- PC and Macintosh compatible and features a parallel, serial and USB port.
- Increased printable area means you can set the margin to 3mm on all four sides of an A4 page - perfect when printing enlargement of your favourite photo.

EPS330 EPSON Stylus Color 740

\$489

EPSON Stylus Photo 700

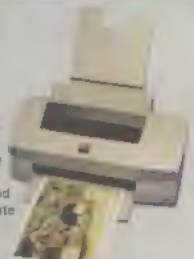
The 1440dpi Photo Printer for home printing needs!

Combining the superior performance of EPSON's PerfectPicture Imaging System and 1440 dpi print resolution this printer offers photographic quality colour and sharp black text printing as standard - perfect for all home printing needs. It uses 6-colour QuickDry inks, that add light cyan and light magenta to the traditional palette of cyan, magenta, yellow and black. There's really no limit to the fun you can have with and EPSON STYLUS PHOTO 700. Printing your own pictures is only the beginning - you can also print Internet website pages with amazing speed and clarity. And to expand your horizons even further, there's a wide range of special papers and other media that let you create greeting cards, T-shirt transfers and more.

Now you have THE POWER TO CREATE

EPS312 EPSON Stylus Photo 700

\$419



EPSON Stylus Color 850

High Performance, High Quality

The EPSON Stylus Color 850 is a revolutionary new printer targeted at business and professional graphics users wanting maximum colour output combined with speed and professional graphics. It features 1440dpi resolution and high speed printing capabilities making it the ideal printer for busy professionals. The COLOR 850 is designed for multi-platform compatibility and easy networking. An optional PostScript RIP (StylusRIP) enables it to be converted to a low-cost PostScript colour printer.

EPS315 EPSON Stylus Color 850

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EPSON Stylus Photo EX

A3 Photo Quality Printing

With A3 Photo Reproduction Quality as standard, 1440 x 720 dpi resolution and 6-colour QuickDry inks, the EPSON Stylus Photo EX is the ultimate photo printer. It uses the latest technology to produce true photo quality output - up to A3 in size, max print width is 297mm making it the perfect colour printing solution for photographic enthusiasts, graphic designers and in-house publishers.

It supports both Windows and Macintosh colour matching systems, which together with EPSON's PhotoEnhance 2 function ensures colour photographs are optimised for colour and exposure values. And, with the optional StylusRIP the EPSON Stylus Photo EX can easily be upgraded to a PostScript printer giving you more POWER TO CREATE.

EPS316 EPSON Stylus Photo EX

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Canon

Select the BubbleJet™ printer that's right for you

BJC-255SP

Super Performance, Brilliant Colour.

- Features**
- Super Economy mode to cut operating costs.
 - Plus a fast, high capacity, black ink cartridge.
 - Print up to 2400 pages in B&W and 600 colour pages per cartridge.
 - Photo Mode for spectacular plain paper colour.
 - Gold standard photographic printing with optional PhotoRealism inks.
 - Plus better Internet printing for images and text.



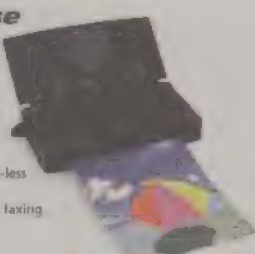
CAN235 Canon BJC-255SP Printer

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BJC-80

Uses half your briefcase not half your desktop!

- Drop Modulation Technology™ - the dual drop size breakthrough that produces smoother colour graduations.
- Office laser quality finish and B&W speeds up to 4.5 pages per minute with dedicated black cartridge.
- Better Internet images with Image Optimiser.
- Windows 95 compatible IrDA infrared port for cable-less communications.
- Optional scanner head for colour graphics, OCR and faxing.
- Fits in half a briefcase, weighs only 1.4kg!
- International warranty included with purchase.



CAN001 Canon BJC-80 Portable Printer

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BJC-4310SP

Just about everything you could want, and a little bit more.

- Super Economy for low-cost colour and B&W printing.
- Print up to 3600 B&W pages with BC-20 cartridge, and 800 B&W and 400 colour pages with BC-21e cartridge.
- Optional PhotoRealism inks for gold standard photo quality printing.
- High speed black cartridge prints up to 4.5 pages per min.
- Banner printing up to 6 A4 pages in length.
- Better Internet printing with Image Optimiser.
- Automatic Feed holds up to 100 sheets.



CAN094 Canon BJC-4310SP

\$265

BJC-4650

- Full colour printing up to A3 - for CAD, DTP and design work.
- Convert your printer into a colour scanner with the optional scan head.
- Automatic switching for Windows and Macintosh.
- PhotoRealism, the gold standard, near silver-halide photographic quality.
- Drop Modulation Technology™ for improved colour graduations, on any paper.
- Economical colour print head for plain paper printing.
- Image Optimiser improves quality of images down-loaded from the Internet.
- Optional high-speed black ink cartridge for B&W printing.
- Fluorescent ink option for signs and retail displays.



CAN218 Canon BJC-4650 Printer

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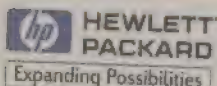
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- Exclusive HP ZoomSmart Scaling Technology
- Automatically arranges pages for booklet binding
- Compatible with Windows 3.1x, 95, NT and MS-DOS 3.3 & above



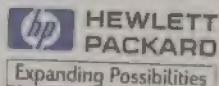
HPP019 HP DeskJet 1120C.....**\$839**

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HP LaserJet 1100

It's the new, improved personal laser printer standard

- 8 pages per minute rated engine speed
- 2 MB RAM handles complex documents with ease
- Improved print quality produces better graphics and images
- 125 sheets bin capacity
- Enhanced driver allows manual duplexing and N-up printing
- HP UltraPrecise Toner Cartridge for improved gray scale images
- Parallel cable in the box
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- JetPath technology allows you to add copying and scanning capabilities



HWP257 HP LaserJet 1100.....**\$789**

HP LaserJet 1100A

- All the features of the 1100 plus Print - Copy - Scan**
- All-in-One functions bring efficiency to the desktop and save desk space
 - Copy with the touch of a button, with or without the PC on
 - Scan hard-copy documents and turn them into electronic images for editing, filing, and communicating via e-mail and PC fax
 - Automatically feed up to 20 sheets for copying and scanning
 - Network connectivity with optional HP JetDirect External Print Servers

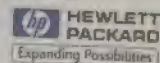
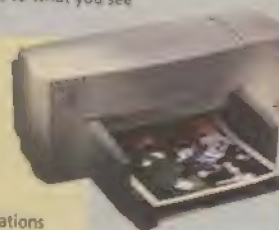
HWP258 HP LaserJet 1100A.....**\$965**

HP DeskJet 710C Printer

HP's brilliant photo-quality colour printer at the right price.

The HP DeskJet 710C makes everything you print look great, even on plain paper. With HP's RealLife Imaging System, brilliant photo-quality colour printing is easy. Built-in ColorSmart II gives you perfect colour automatically, so what you see on screen is what you get.

- up to 6 pages per minute black, 3 pages per minute colour
- resolution 600 dpi black, HP PhotoREt II colour
- built-in photo-quality color
- exclusive HP inks dry fast for smudge-resistant text and photos
- handles a variety of papers, including plain and special papers, envelopes, transparencies and banners
- compact design and quiet operation ideal for small workspaces
- easy setup and operation provide hassle-free printing
- compatible with Windows NT 4.0, 98, 95, 3.1x and MS DOS applications through Windows 98, 95 and 3.1x



HWP346 HP DeskJet 710C.....**\$429**

HP DeskJet 695C Printer

The Printer for Easy, Quality Colour Results!

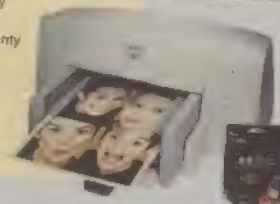
The affordable printer for easy, quality colour results and optional photo quality printing.

- 5 pages per minute black
- 1.7 pages per minute colour printing
- HP's RealLife Imaging System, incorporating HP ColorSmart II technology
- Prints on Plain and special papers, transparencies, labels, envelopes and banner paper
- Optional HP Photo Cartridge with built-in HP PhotoREt for lifelike, photo-quality colour
- Windows NT 4.0, 98, 3.1x and many MS-DOS applications
- Black and up to 16.7 million colours

- Key Features:**
- 1800x600dpi black resolution and 600x300dpi colour resolution
 - 100 sheet input capacity
 - Parallel interface
 - 1-year limited HP warranty

Included in the Box:

- power adapter
- black print cartridge
- colour print cartridge
- printer software
- user's guide



HWP365 HP DeskJet 695C.....**\$269**

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HPP035 HP Glossy Greeting Cards (10 sheets/10 envelopes)	\$19
AUC107 HP Banner Paper A4 (100 sheets)	\$25
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HPP038 HP Fun Pack	\$59
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AUC126 C3903A	\$145
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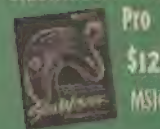
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MSS048 MS Windows NT Workstation 4.0 w/g **\$229**

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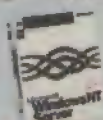
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- globally manage users and security from a central location
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Microsoft BackOffice Small Business makes it easy to manage and grow your business and now with Microsoft Office 97 Pro You Have the Complete Business Solution.



Microsoft Small Business Server features award-winning products that give you everything you need to run a growing business. Designed for companies with 25 or fewer PCs, it's an integrated solution for sharing files, databases, printers, electronic mail, fax services, applications, and other resources with anyone, anywhere, at any time—all from one integrated server. You get advanced communication services and fast, flexible access to the Internet. Best of all, the server is exceptionally easy to set up, manage, and use, so you can get up and running with it right away. Microsoft BackOffice has been designed to work with the complete range of Microsoft desktop applications, so the latest, best solutions will continue to be available for your

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Microsoft BackOffice Version 4.0



Microsoft BackOffice provides the integration, ease of use, scalability and manageability hitherto unavailable with traditional client server or Internet software. It provides the best foundation for a new class of solutions that combine the best of three-tier client server and Internet technologies allowing either thick client or thin client solutions to be used as appropriate.

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MSS131 MS BackOffice Server 4.0 Comp U/G	\$3169
MSS132 MS BackOffice Server 4.0 Version U/G	\$1349

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Microsoft Windows NT Server 4.0

A multipurpose network operating system that is the most powerful, reliable and open platform to build, deploy and manage file and print sharing, client-server and Internet applications for your networks. Windows NT 4.0 includes Internet information Server - so you have all you need to set up a web server

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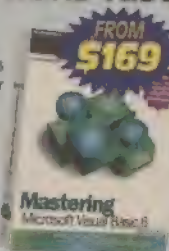
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Microsoft Visual Studio 6.0

Product/Components	Description	Pro.	Ent.
Microsoft Visual Basic 6.0, Visual C++, Visual FoxPro 6.0, Visual InterDev 6.0, Visual J++ 6.0, MSDN Library Special Edition	The complete suite of Microsoft Visual Tools.	•	•
Enterprise Visual Database Tools	Visually design databases and views, and create and test stored procedures for Microsoft SQL Server 6.5+ and Oracle 7.0+ databases.		•
Microsoft BackOffice 4.5 Developer Edition (for Windows NT only)	Build Windows NT-based solution that can be accessed from Windows-based or Web-based clients and integrated in enterprise environment with selected server technologies form the Microsoft BackOffice family. The Development License for Microsoft BackOffice Server 4.5 includes Microsoft SQL Server, Microsoft Exchange, Microsoft SNA Server, Microsoft Site Server, Microsoft Systems Management Server and Windows NT Server.		•
Team Support	Microsoft Visual SourceSafe version control system version 6.0, Visual Component Manager, and Microsoft Repository.		•
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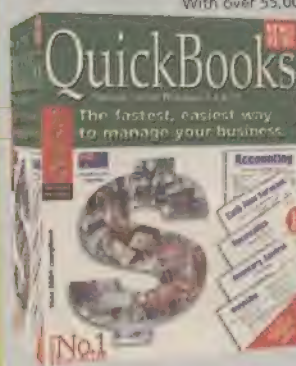
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Category Index

Accounts	10,11
Business Development	13
Business	16,17
CAD	24,25
Communication	26,27
Digital Cameras	40
Graphics Cards	42,43
Graphics/BTP Software	18-23
Internet	40,41
Microsoft	3,8,9
Modems	44,45
Networking	47
Notebooks	4
OCR	34,36
PCs	5
Printers	6,7
Reference/Training	12
Scanners	35,36,37
Storage	31-39
Tape Backup	46
UPS	46
Utilities	26-31
Video Capture	40,42,43
Voice Recognition	14,15,17
Y2K	32,33

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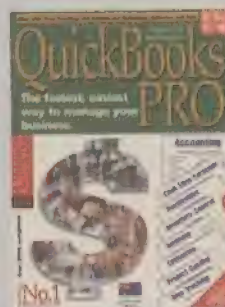
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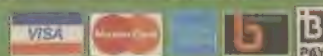
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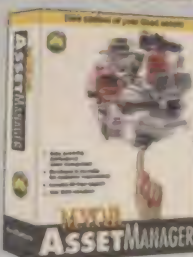
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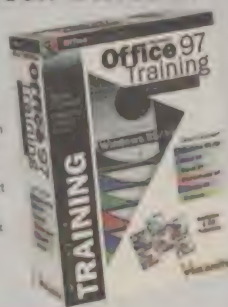
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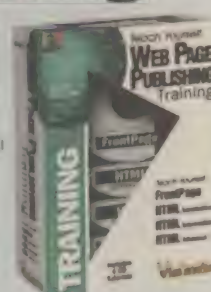
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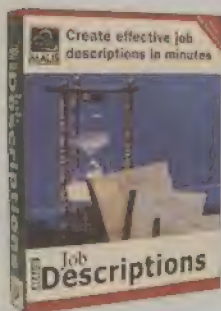
- MAUS MasterPlan Professional
- Consultant's Guide to Business Planning
- Special Consultancy Software
- Questionnaires for clients
- Training Manual

MAU003 MAUS Consultant's Pack
(Inc MAUS MasterPlan Professional)

\$479

MAUS Job Descriptions

Write job descriptions in minutes!



MAUS Job Descriptions will help you create clear, concise job descriptions in minutes! Simply choose from the thousands of built-in jobs and edit or even combine duties from different jobs. Next, use the simple question and answer approach to address the physical and educational requirements, work environment, qualifications and supervisory responsibilities.

MAUS Job Descriptions will then take your answers and write a comprehensive job description that's fully customised to your organisation.

...It's that fast. It's that easy!

MAUS Performance Review

For fast, effective employee appraisals!

Described by PC Authority as "one of the first products any manager should load onto their PC", MAUS Performance Review will help you create accurate, personalised employee reviews in minutes! Simply choose from the dozens of performance criteria such as initiative, leadership, problem solving ability, and sales skills...to name just a few! Next, use the simple 1 - 5 grading system to rank your employees in each area. MAUS Performance Review will then support your ratings with clear, effective text...

...It's that fast. It's that easy!

Key Benefits

- Create job descriptions in minutes
- Over 3,500 sample job descriptions to choose from
- Hire the right people
- Improve productivity
- Protect your organisation against unfair dismissal claims

What the Press are saying:

"Job Descriptions offers 3,500 professional descriptions and Performance Review gives a list to follow when judging staff performance."

Sydney Morning Herald (18th August 1998)

"...ideally designed to be used in conjunction with job interviews, HR planning and annual staff reviews"

The Age (25th August 1998)

"...simple, affordable, revolutionary"

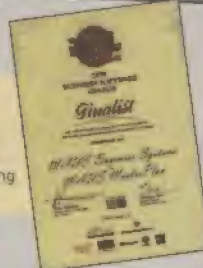
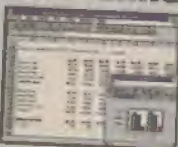
Instore Magazine (September 1998)

★★★★★ 6/6 Performance & Value for Money

PC Authority (October 1998)

Key Benefits

- Save 50-90% of the time to write employee reviews
- Simple step-by-step approach
- Record ongoing problems and achievements
- Accurate, personalised reviews
- Clear, natural text flows



What the Press are Saying

"The brilliance of this system is that you're led through the entire process step by step... the results will be as good as anything a professional would have provided for you"

Your Computer Magazine

Key Benefits

- Creates complete Business & Marketing Plans
- Suitable for business people of all levels
- Creates full financials & graphs
- Includes a simple step-by-step tutorial

AUS501 MAUS MasterPlan for Windows - Level 2 Professional (2 in 1 Business & Marketing Planner)

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SO WHO ARE UMAX?

Umax are the most popular scanners in the USA, and world leaders in imaging and computer technologies. And they are now available to PC users in Australia. Umax provide a complete range of scanners from the price leading 600p, right through to high end professional flatbed solutions. International Software Warehouse can tailor a scanner to suit your needs, so call 1 300 300 003 with your requirements. Umax also supply high quality monitors at an affordable price.

Maxvision Bs

15 inch FST, 0.28mm dot pitch, Non glare, 1280 x 1024 @ 100Hz max Nt



UMA016 **\$349**

Maxvision B7

17 inch FST, 0.27mm dot pitch, Non glare, 1280 x 1024 @ 70Hz Max Nt

UMA017 **\$689**

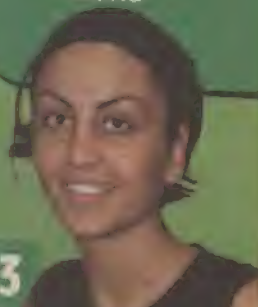


Maxvision B7 Plus

17 inch FST, 0.25mm dot pitch, Non glare dark glass, 1600 x 1200 @ 87Hz Max Nt, Standby power switch

LIMA018 **\$995**

Maria



MAU006 MAUS Job Descriptions and Performance Review

Save \$30

\$348

MAU005 MAUS Job Descriptions

\$169

MAU004 MAUS Performance Review

\$169

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Enquiries 02 9700 8800 Internet site www.iswh.com.au

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**Voice
Recognition**

INTERNATIONAL SOFTWARE WAREHOUSE Pty. Ltd.

EVERYTHING FOR YOUR PC - DELIVERED NATIONWIDE!

Let your talking do the typing Dragon Point and Speak



Point and Speak is the natural way to input text. Almost anyone - business professionals, writers and journalists, students, non typists, and office employees can find themselves quickly creating documents and reports with unparalleled ease and accuracy.

Features:

- True Continuous Speech - just speak naturally, without the need to pause between words
- Works with Windows applications including Corel Word Perfect, Lotus Notes, Microsoft Word, Microsoft Office, Eudora Mail, and many others
- Learns most speaking styles, even strong accents, and supports multiple users
- Up to 160 Words per minute
- Accuracy as high as 98%
- Supports multiple users
- Contains 30,000 word active vocabulary and 230,000 word total vocabulary
- Includes high quality microphone

Let
your talking
do the
typing!!!

DRG005
\$99

Dragon Naturally Speaking Standard

Dragon Naturally Speaking is the world's first and foremost software product that recognises and creates text from normal continuous speech. Dragon Naturally Speaking is acclaimed in competitive reviews for its accuracy, performance and ease of use. Just talk to your PC naturally, at a conversational pace. Dictate entire paragraphs at a time. Write email messages, create reports, draft letters, and edit proposals just by speaking.

All the features of Dragon Point and Speak, plus:

- Immediate Recognition - Your words appear immediately on your screen and in your document.
- Integration with Microsoft Word 97 and Corel WordPerfect 8 - with Dragon Systems editing technology create, edit anytime, and format any word or phrase easily using intuitive commands.
- New, Larger Vocabulary - more than 35,000 active words (230,000 total). Personalise your vocabulary by automatically adding new words, specialised terms, and names in a few simple steps.
- Hands-Free Editing - Move your mouse pointer with pinpoint accuracy, click buttons, "press" any key on the keyboard, and activate menus by simple voice commands.
- Text Shorthands - Quickly insert frequently used phrases and sentences just by saying a single word or phrase

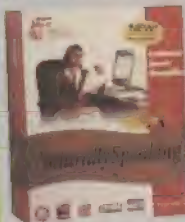


DRG004
\$179

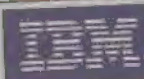
Dragon Naturally Speaking Preferred

All the features of Dragon Naturally Speaking Standard, plus:

- Even Higher Accuracy - Industry-leading BestMatch recognition technology reduces errors by 25% to achieve higher accuracy than ever before.
- New, Even Larger Vocabulary - 42,000 active words (230,000 total)
- Text-To-Speech - Listen to your own documents or other files such as e-mail read aloud to you.
- Dictation Playback - Listen to a recording of what you said before you edit, in order to keep your original intent.



DRG003
\$299



**Business
Partner**

ViaVoice 98 Executive The Premier Continuous Speech System From IBM

ViaVoice 98 Executive is the essential tool for productivity. Create letters, e-mail, reports, proposals, plans... all with the power of your voice.

Powerfully Useful Speech Recognition

- Dictate directly into Microsoft Word 97 and the most popular Microsoft Windows applications, using normal continuous speech. Create text faster than most people can type.
- Use the power of your voice to create reports, presentations and spreadsheets quickly
- Enjoy high recognition accuracy - ViaVoice 98 uses three word context checking to help it recognise the words you dictate.
- Create "VoiceText" dictation macros to insert standard paragraphs without having to stop dictating.
- Control your PC by launching programs with your voice. Say file names, toolbar buttons and icon names with "Say What You See" navigation.

NEW Key Features:

- Say numbers, currencies, dates and prices normally and they appear in the correct format
- Switch between commands, correction and dictation quickly, easily and naturally, thanks to the new modeless operation.
- Use intuitive natural Language Commands in Microsoft Word 97 for easy formatting and editing. You can create documents, insert tables, change fonts, move paragraphs and print the perfect document. For example, when you want to insert a table, pause and say, "Insert a table with three rows and four columns"

Proof-reading And Editing Made Easy

- Playback your dictation in your own voice to help you make corrections.
- Make corrections as you dictate, later, or delegate them to a colleague. Your recorded voice remains with the file to aid correction.
- Have your text or e-mail read back to you with ViaVoice Outloud text-to-speech.

Simple Set-up

- Perform the short optional (recommended) enrolment to teach the system the sound of your voice.
- Find what commands you can say just by asking, "What can I say?"
- Set the system for use in different environments, or by more than one person on the same PC.
- Format, correct and edit dictated text with your voice.
- Expand the 56,000 word UK English base vocabulary with up to 64,000 personal words.
- Use the included 240,000 word back up dictionary.
- Activate the specialised ViaVoice Legal Topic, which is included, to extend your vocabulary with words used in the legal profession - all correctly spelt!
- Move Briskly through set-up and training with the ViaVoice User Wizard
- Learn quickly by using multimedia Quick Tours, VoiceTips, extensive on-line help and the comprehensive User Guide.

Includes
Lightweight, Noise
Cancelling
Microphone



For Windows 95,
Windows 98 & NT

\$239
\$89

IBM080 IBM ViaVoice 98 Executive

IBM158 IBM ViaVoice 98 Home

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a local call Orderline 1300 300 003 or 02 9700 8800

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KENS KORNER

This month I have heaps of fantastic bargains waiting to be snapped up. Some are previous versions, others have damaged packaging, but ALL carry full guarantees and warranties.

Remember, there are limited stocks so call quickly.

Logitech Scanman z56

\$15

Sony Storstation 2Gb

\$249

Oxford Encyclopaedia

\$29

Visio V4

\$49

There are many more that I can't fit in here. For a full listing, check out my section on our website at www.iswh.com.au

See you next month!

Ken



INTERNATIONAL SOFTWARE WAREHOUSE Pty. Ltd.

Voice Recognition

DON'T FORGET TO ASK FOR YOUR FREE GIFT

SURVIVE THE MILLENNIUM BUG!

Between February 1st, 1999 & March 31st, 1999 IMSI will be helping you get Year 2000 ready. We will be including a free CD copy (OEM version) of our survive the millennium bug product, Year 2000 Now, with all our products.

VoiceDirect Continuous Gold

Put Your Commanding Voice to Work Today

Voice-control your computer without having to pause between words. Create documents faster than many skilled typists. You can even use your voice to control Windows and Microsoft Word! Speak to your computer like you are talking to a friend. VoiceDirect Continuous Gold delivers the reliability, accuracy, and ease-of-use you need to get the most from your time at the computer-hands down!

You...Don't...Talk...Like...A...Robot

Why dictate that way? Continuous Speech VoiceDirect products learn to interpret the way you speak naturally - not one word at a time like discreet products. And using industry-leading ViaVoice technology, VoiceDirect is as accurate as any speech recognition software you can buy!

Perfect for professionals in small business and corporate settings, writers, power users, and mobile PC users needing a powerful and complete speech recognition solution that allows for the operation of command and control functions.

Key Features:

- Fast, continuous speech recognition with no pausing between words
- Voice command and control of the Windows desktop
- Voice command and control of Microsoft Word
- Word recognition that eliminates spelling errors
- Transfer dictation directly into popular programs with a mouse click
- User Wizard for quick orientation
- Keyword shortcuts to trigger commonly used phrases, addresses, etc.
- IBM's multi-patented industry-leading technology
- Context recognition to distinguish between similar-sounding words and phrases
- Text-to-Speech feature that reads compositions and imported text aloud
- Base vocabulary of 22,000, expandable and customisable to 64,000 words
- Plus, a 260,000 word back-up dictionary
- Save feature for convenient correction options
- Includes Premium noise-cancelling microphone

System Requirements:

- Pentium 166 MHz or 150 MHz with MMX
- Windows 95, Windows 98 or Windows NT 4.0
- 32MB RAM for Windows 95 & Windows 98, 48MB RAM for Windows NT 4.0
- 125MB available hard disk space
- Creative Labs Sound Blaster 16 or 100% compatible, or Mwave audio system
- Some laptops and sound cards may require a microphone battery adapter
- CD-ROM Drive

Note: VoiceDirect products support a variety of popular software including Microsoft Word 6.0, 95 and 97, PowerPoint 7.0, Excel 7.0, and Exchange, Lotus SmartSuite 9.7, Lotus 1-2-3, Lotus Notes 4.5, Corel Perfect Office 7, WordPerfect 7.0, and more.

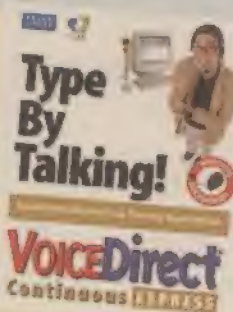
VoiceDirect Continuous Express

Go ahead, Speak Naturally!

Take a hands-off approach to using your PC by speaking instead of typing. Using IBM ViaVoice technology, VoiceDirect is a professional speech recognition system that lets you speak into virtually any Windows application - just by speaking in your normal voice, up to 100 words per minute! Perfect for home users and students who want to bring state-of-the-art speech recognition technology into their computing environment.

Key Features:

- Continuous Speech Technology
- Speak Directly Into Applications
- Macros
- Error Correction
- Shortcuts
- Context Recognition
- Extensive Vocabulary and Backup Dictionary
- Command and Control in Word 95 & 97 (30 Day Limited Use)
- Command and Control of the Windows desktop (30 Day Limited Use)
- Standard Microphone
- UpdateNow (30 Day Trial)



IMSI

\$89

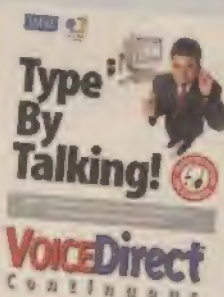
VoiceDirect Continuous

Speak Naturally, Plus, Have Text Read Back To You!

Free yourself from the tedium of typing-without sacrificing accuracy or speed. Continuous speech recognition gives you and your favourite applications the ease, accuracy, and intelligence to all but do away with your keyboard. Just point your mouse and speak naturally-without having to pause between words. Perfect for small business and home office users wanting to improve productivity with the benefits offered by speech recognition - fast computing, and freeing of the hands for other tasks.

Key Features:

- Fast, continuous speech recognition-no pausing between words
- Transfer dictation directly into popular programs with a mouse click
- User Wizard for quick orientation
- Key word shortcuts to trigger commonly used phrases, addresses, even whole pages
- Context recognition to distinguish between similar-sounding words and phrases
- Text-to-Speech feature that reads compositions and imported text aloud
- Base vocabulary of 22,000, expandable and customisable to 64,000 words
- Plus, a 260,000 word back-up dictionary
- Save feature for convenient correction options
- Includes a premium noise-cancelling microphone



IMSI

\$139

IMSI

Type By Talking!

Speak Naturally Into Your Favorite Applications. Plus-Command & Control, Text to Speech & More!

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IMSI

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IMS016

Kieran



IMS140 VoiceDirect Continuous Express

IMS141 VoiceDirect Continuous

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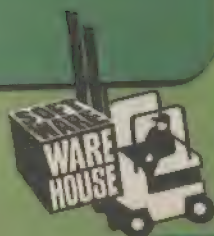
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FEATURES

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- ✓ Covers all relevant clauses of ISO 9001/2
- ✓ Works with your familiar word-processor
- ✓ Work at your own pace

CD Format (Professional licences and 3.5 Disk version also available)

TQA004 TQA v5 Single User Licence.....



\$379

Manage your quality system without bulging filing cabinets

TQA Quality Manager

✓ DOCUMENT & DATA CONTROL

Master List To track important documents and data. Records display number, title, version & issue date. Links to leading Windows word processors to view documents. With network licence, documents may be distributed electronically. Also includes Copy Holders List, Revisions List & Deletions List

✓ INTERNAL QUALITY AUDITS

Audit Schedule to plan your audit program, and identify outstanding audits. Generate Audit Reports online. Duplicate Schedule reproduces checklists and other details for future years. List Internal Auditors, their contact details, and audits

✓ NONCONFORMANCES / CORRECTIVE ACTION

Nonconformance List displays summary and outline of all reported nonconformances. Generate Nonconformance Reports online. Various Query facilities.

✓ MANAGEMENT REVIEW

Record Minutes of Meetings. Default agenda and facility to create custom agenda.



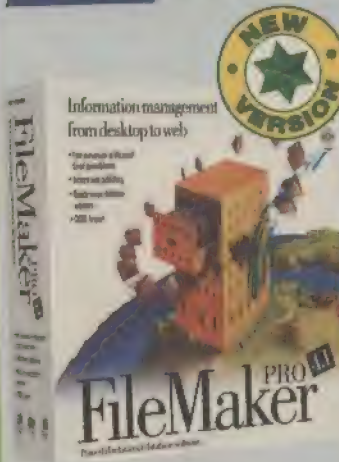
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TQA002 TQA Quality Manager.....

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FileMaker Pro 4.1 - Complete Your Office Suite

Now handles ODBC Import

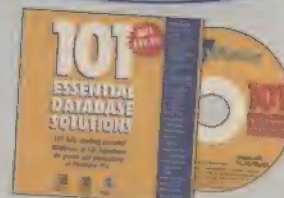


For only a fraction more, Complete Your Office Suite lets you benefit from the productivity of a powerful relational database like FileMaker Pro.

FileMaker Pro 4.1 gives you powerful new relational database features, instant web publishing, fast conversion of Microsoft Excel spreadsheets and ready-to-use database solutions. FileMaker Pro is a software package that lets you work with and share information wherever you need it.

Powerful relational database software

- **NEW** built-in intuitive ODBC SQL Query Dialog lets users query ODBC data sources without requiring SQL programming expertise
- Share departmental and regional information with instant web publishing - no separate web server application required
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- Take advantage of FileMaker Connection Assistant in HomePage 3 software (not included) to design eye-catching, interactive web pages.
- Access word processing functionality in any text field to customize fonts, styles, tabs, indents, and text attributes.
- Automate routine tasks easily with ScriptMaker.
- Create relational solutions to increase the power and flexibility of your databases. Even sort information from related databases.
- Share files between Windows and MacOS versions.



Features:

- Runtime version of FileMaker on the CD.
- 101 ready-to-use database solutions built in FileMaker Pro - timesheets, vehicle logbooks, business card maker, invoice maker and more.
- \$19.95 Refund when you purchase and register a full version of FileMaker Pro product

FIL004 FileMaker Pro 4.1 **\$355**

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FIL003 FileMaker Pro 4.0 **\$825**

Developer Edition **\$19.95**

CLA060 FileMaker complete Your Office Suite **\$19.95**

FileMaker Pro 4.0 Developer Edition has received 100% Pure Java Certification from Sun Microsystems' Java software division. The Developer Edition features an application program interface allowing developers to write external functions for FileMaker Pro Databases. Enjoy the benefits of easily developing cross platform, very important for creating databases for company Internet, intranet and extranet Web sites.

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COREL® WordPerfect Suite 8 with Dragon NaturallySpeaking

The World-Class Office Suite now includes leading Speech Recognition Technology

Corel WordPerfect Suite 8 with Dragon NaturallySpeaking brings together two award-winning products to give you powerful office software, the latest Internet technology and speech-enabled word processing. Because Dragon NaturallySpeaking is fully integrated into Corel WordPerfect 8, you can create documents just by speaking to your computer!

- Slide Show
- Personal Information Manager
- Word Processor
- Spreadsheet



WordPerfect 8 - The world's best word processor - improved Shadow Cursor and lots of new features.

- Versions - keeps track of document revisions for workgroup collaboration.
- Internet Publishing Capabilities - edit or create your document in WordPerfect and publish it to HTML with support for embedded Java applets.



Corel Quattro Pro 8 - A powerful spreadsheet application - import functions and macros from Excel and Lotus 1-2-3. Quickly and easily create charts and formulas with new & improved features like:

- WYSIWYG Page View and Cell Reference Checker.



Corel Presentations 8 - Enables you to design professional presentations with many improvements and new features such as:

- Transition Effects - 120 effects to add excitement to your presentations
- Show It - Publish your presentations on the Web - full support for animation, sound, graphics and video.



CorelCENTRAL - A new fully featured Information Manager offering a wide range of features including Internet Conferencing, email Mailbox, Calendaring and Scheduling, Address Book and Flexible Card Files.

Amazing Value

You get all this:

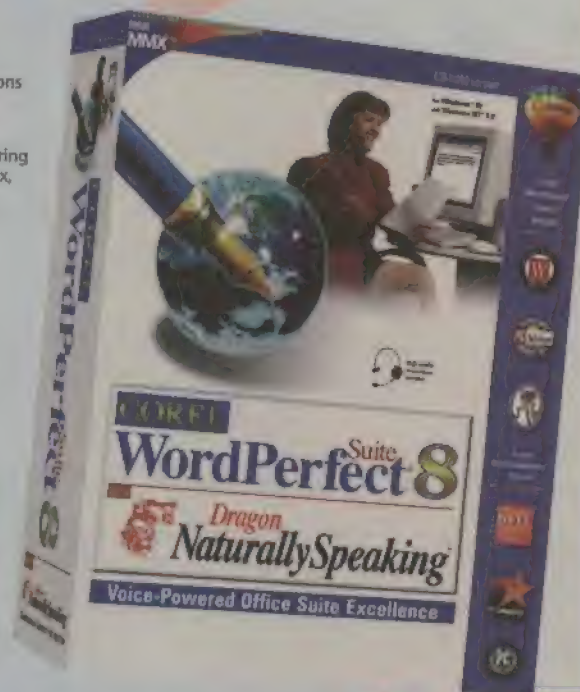
Corel WordPerfect 8
Corel Quattro Pro 8
Corel Presentations 8
CorelCENTRAL 8 with fully integrated
Netscape Communicator 4.04 &
Dragon NaturallySpeaking
Personal Edition 2.0
High quality Headset and Microphone

Plus

Grolier Multimedia Encyclopedia
1998 version
Corel Photo House 2
Envoy Viewer 7
Corel Software Developer's Kit
Corel Barista Printer Driver
Quick View Plus

Dragon NaturallySpeaking Features:

- True Continuous Speech - speak to your computer naturally and at a normal pace, up to 160 words per minute
- Immediate Recognition. Your words appear immediately on your screen and in your document
- Highly Accurate - typical accuracy: 95% up to 98%
- Extensive vocabulary - built-in active vocabulary of 30,000 words and a total vocabulary of over 230,000 words
- Personalize vocabulary - automatically add unique words, terms, and names
- Learns dialects, accents, and individual pronunciations quickly and automatically
- Correct and edit anytime. Changes can be made as you go or later
- Text shortcuts - quickly insert frequently used phrases and sentences just by saying a single word or phrase
- Plus much more!



**COR527 Corel WordPerfect Suite 8 U/G
& Dragon Naturally Speaking.....**

\$269



Corel Print Office

Create eye-catching documents for all your business needs with the easy-to-use tools in Corel Print Office. This comprehensive publishing solution for home offices and small business includes thousands of business-specific clipart images and photos, and hundreds of professionally designed, customizable templates. Let wizards guide you through projects and use photo-editing tools to add exciting effects. Samples from PaperDirect, along with special offers from Avery® and Kodak make your printed projects look great. Take advantage of compatibility with major word-processing file formats and the ability to publish directly to the Web. Get polished results every time with Corel Print Office!

COR540 Corel Print Office

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3COM PALM III



Stay organised, wherever you go! The 3COM Palm III is the latest version of the award winning range of personal organisers from 3COM. Weighing in at an amazing 126 grams (approx 160 grams including the batteries) and measuring 12cm by 8cm by 2cm, the Palm III can:

- Store 6000 addresses
- 5 years of appointments
- 1500 to do items
- 1500 memos
- 200 emails

It includes an address book, date book, to do list, memo pad, expense report templates, calculator, security options and some bonus games. Powerful enough to keep you organised. Small enough to fit in your pocket. The amazing Palm III from 3COM.

US\$51..... **\$629**

Melody



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Plug-in to Big Savings with Extensis

Extensis Mask Pro 2.0

provides expert-level tools that dramatically reduce the time necessary for masking and selecting complex objects in Adobe Photoshop. Includes Color Matching Technology, advanced edge blending, and vector-based clipping paths.



Features

- Exclusive Keep and Drop Color Matching Technology creates highly-detailed masks and selections
- New IntelliBrush and IntelliWand tools remove backgrounds with a single click.
- Advanced PrecisionEdge detection automatically creates perfect edges between contrasting areas of an image.
- New EdgeBlender technology instantly subtracts background colours from partially transparent mask edges.

EXT021 Mask Pro 2.0 **\$469**

Extensis PhotoTools 3.0

contains major enhancements to its versatile collection of real-world special effects tools for print, multimedia and web design such as multiple light sources in PhotoCastShadow and textured surfaces in PhotoButton. In addition, PhotoTools 3.0 now includes 3 new components—PhotoTexture,



PhotoAnimator and PhotoGroove, which represent revolutionary approaches to the common Photoshop tasks of creating seamless tile textures, complex GIF animations and custom bevels.



MacWEEK

Features

- PhotoTexture creates an infinite variety of show-stopping textures while automatically ensuring seamless edges.
- PhotoAnimator automatically generates the frames and transitions for unlimited animation special effects. Instead of building each frame of an animation manually, just decide how you want something animated, and let PhotoAnimator do the rest.
- PhotoGroove lets users interactively design custom bevels of any shape and size.
- PhotoCastShadow can now interactively create multiple shadows from multiple light sources. PhotoButton now includes user-defined bevels and button shapes, textured surfaces and bump maps for creating groups of high-quality buttons.

EXT022 PhotoTools 3.0 **\$279**

Extensis QX-Tools 4.0



extends QuarkXPress 4.0 (Mac and Win) with vastly expanded graphic import options plus tools that speed creating, sorting editing, modifying and navigating through objects inside of a document.



eMedia **weekly**

Features

- QX-VectorEdit imports anything printable into QuarkXPress including Word tables, Excel charts, Illustrator, FreeHand and PDF artwork, and more, by converting PostScript to QuarkXPress objects.
- QX-Scaler resizes groups of QuarkXPress objects with flexible precision and the ability to undo.
- Create, modify, delete and add objects to layers with QX-Layers. Works like you expect layers to work.
- QX-FindChange extends searching and replacing to over 50 object attributes across all QuarkXPress objects. Use greater (>) and less than (<) symbols for incredible flexibility.
- QX-ItemStyles extends style sheets to over 50 QuarkXPress object attributes. Editing the style instantly updates all affected objects, ensuring design consistency and fast global changes.

EXT023 QX-Tools 4.0 **\$279**

QuarkXPress 4.0 for Windows

The professionals choice for publishing software - worldwide

Soon after QuarkXpress was introduced, it became the standard for excellence in professional publishing. It offered new flexibility and un-heard of precision. Today, QuarkXPress remains the layout and design choice of the world's top publishers. In fact, most of the magazines and newspapers you are familiar with are created with QuarkXPress (this one is). When you need to create business cards, annual reports, full colour brochures, magazines or catalogues, your publications will benefit from the precision, power, and flexibility of QuarkXPress.

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QUA138 QuarkXPress 4.0 for Windows

QUA139 QuarkXPress 4.0 MAC/PowerMac.....

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All the Internet creation tools you'll ever need in the one box.

You cannot go past this unbelievable new integrated package from Adobe systems, which includes FOUR Adobe Web products in one box for a special price. This fabulous product allows you to design Web pages without having to know HTML, quickly optimise images for the Web, add special effects to your images and create buttons, navigation bars, banners and more. Perfect for home users, Small to Medium Enterprises, Graphic Producers and SOHO.

The Adobe Internet Pack includes full working versions of the following Adobe products:

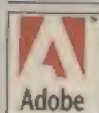
- ImageReady 1.0
- PageMill 3.0
- ImageStyle 1.0
- PhotoDeluxe 2.0

ADO125 Adobe Internet Pack for Windows.....

\$359

ADO126 Adobe Internet Pack for Mac.....

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ADOBE PUBLISHING COLLECTION For Windows & Mac



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- Adobe Acrobat 3.0
- Adobe Illustrator 8.0
- Adobe Streamline 4.0
- Adobe Photoshop 5.0
- Adobe Dimensions 3.0

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ADO131 Adobe Publishing Collection II for Mac.....

\$1749



The complete package for the creation, assembly and delivery of printed and electronic documents

Adobe Publishing Collection

Adobe Acrobat 3.01

The fastest way to publish any document on-line.

With Acrobat, you can send a document electronically anywhere - by email, the Web or CD-Rom - and the recipient can view and print it exactly as it was created.

Users are wide and varied and include everyone from Corporate intranet users to sales and marketing professionals, website managers and business communicators.

Key features include:

- Enables users to easily convert any file from any application to Adobe's Portable Document Format (PDF), a compact, cross-platform electronic format that preserves layout, fonts, colours and images - exactly.
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- Add 'sticky note' annotations, bookmarks, live Web links, security options - even movies and sound - to any PDF file.



ADO029 Adobe Acrobat 3.01 WIN.....

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ADO110 Adobe Acrobat 3.01 MAC.....

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Enquiries 02 9700 8800 Internet site www.iswh.com.au

Adobe Photoshop 5.0

The World standard photo design and production tool.

Adobe Photoshop is used by more creative professionals around the world than any other image editing program. It provides the power to create compelling images and the precision to prepare them for the printed page, the Web, and virtually any other medium.

The following key features highlight just some of the amazing capabilities of this program:

- Create, retouch and enhance images in many formats for virtually every medium.
- Special effects filters for image sharpening, softening, stylising, distortion, natural media and lighting, and more.
- Professional photography tools including brushes textures, Dodge and Burn.
- Adjust colour brightness and contrast, replace colours, and convert between colour formats, including CMYK and RGB.
- Multiple layers for overlaying of images, text, and graphics with complete freedom to edit and experiment with any element.
- Simulate 3D effects easily by scaling, rotating and skewing areas of an image. Even reposition objects in 3D.
- Share files seamlessly between Windows and Mac systems and convert any PDF, Illustrator® or EPS files.



ADO120 Adobe Photoshop 5.0 for Win.....

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ADO139 Adobe Photoshop 5.0 for Mac.....

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SO WHO ARE UMAX?

Umax are the most popular scanners in the USA, and world leaders in imaging and computer technologies. And they are now available to PC users in Australia. Umax provide a complete range of scanners, from the price leading 610p, right through to high end professional flatbed solutions International Software

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15 inch FST, 0.28mm dot pitch
Non glare, 1280 x 1024 @ 70Hz
max NI



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Non glare, 1280 x 1024 @ 70Hz
Max NI



UMA017.....**\$689**

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1200 @ 87Hz Max NI. Standby
power switch



UMA018.....**\$995**

Justin



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KENS KORNER

This month I have heaps of fantastic bargains waiting to be snapped up. Some are previous versions, others have damaged packaging, but ALL carry full guarantees and warranties. Remember, there are limited stocks so call quickly.

Logitech Scanman 256

\$15

Sony Storstation 2Gb

\$249

Oxford Encyclopaedia

\$29

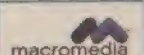
Visio V4

\$49

There are many more that I can't fit in here. For a full listing, check out my section on our website at www.iswh.com.au

See you next month!

Ken



FreeHand 8

The Most Powerful Design Tool for Print and Internet Graphics. Take your design further! With breakthrough creative effects like transparency, excellent performance, precision drawing, type control, and streamlined workflow, FreeHand 8 makes it easy to produce and publish high-quality graphics, illustrations, layouts, and animations. It offers the customisation, special effects, print quality, and animation capabilities you need to put your design in motion.



Features:

- Transparency, Magnify, Invert, Lighten & Darken Lens fills that you can modify at any time
- Save time with Find & Replace Graphics.
- Instantly create special effects for print and the Web.
- Extensive customisation options and seamless integration with other design programmes.
- Modify shapes interactively with push-and-pull editing tools.

- Includes 10,000 updated pieces of clip art, 500 fonts, and templates.
- Modify shapes interactively with push-and-pull editing tools and intuitive transformation handles. Includes 10,000 updated pieces of clipart, 500 fonts, and templates.
- Lay out print projects, storyboards, or cel animations using the multipage environment.

MAC055 Freehand 8

\$789

MAC111 Design in Motion

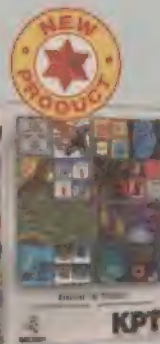
\$899

Kai's Power Tools 5

Kai's Power Tools is the premiere collection of plug-in software tools for Adobe Photoshop and compatible host applications such as MetaCreations' Painter 5.5. You have seen KPT everywhere, whether you realize it or not, on thousands of Web pages, on TV and on countless CD and book covers. In the arsenal of any cutting edge designer, you will find KPT

What can you do with KPT 5?

- Enhance your productivity with precise controls, real-time previews, and extensive presets
- Create compelling and easily reproducible Web graphics
- Explore fantastic textures, vast fractal vistas, complex 3D objects, and endless new permutations of radical image-altering algorithms
- Discover original, artistic possibilities beyond your imagination
- Apply corrective and creative effects to digital photos



MET027 Kai's Power Tools 5

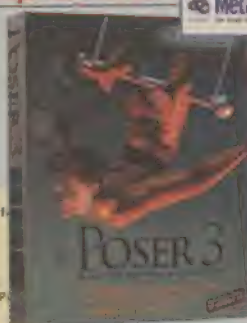
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Poser 3

The Remarkable Figure Design and Animation Tool. Poser 3 is a 3D figure animation and reference tool for digital artists and animators. From an included collection of human and animal models and props, create movies, images and posed 3D figures. The unique and powerful 3D feature set is easy for any user to master

Features:

- All new, easy to use interface with the Meta look and feel
- Incorporates MetaCreation's SREE-D acceleration technology
- Animate facial expressions and hand gestures
- Incorporate five animal models into your Poser scenes.
- Industry standard BVH Motion Capture for animating 3D figures.



MET002 Poser 3

\$379

MET003 Poser 3 upgrade

\$199

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Dream Team

Superbly Integrated Web Software

A premier production tool for Web Site designers has finally arrived! Macromedia are providing serious graphic and web designers the opportunity to work seamlessly through the graphic and production processes of web site creation - with HUGE savings to add.

Included in Macromedia Dream Team:

Macromedia Dreamweaver

- Stay in control of HTML source with Roundtrip HTML. HomeSite is integrated into the Windows version of Dreamweaver.
- Preserve existing HTML formatting when opening pages created with other editors.
- Animate HTML elements without scripting.
- Manage content across a site rather than page-by-page.

Macromedia Fireworks

- Work with any graphic type at any time or slice apart your Web graphics to mix compression types and file formats for the fastest downloads.
- JavaScript Rollovers - create impactful, graphic rollovers without writing any code, and assigning URL links to rollovers couldn't be easier.
- Create special effects like bevels, glows, embosses, and drop shadows that are completely customisable and editable.

Macromedia Flash3

- Designed for professional design, dynamic generation, and universal playback of graphics and animation on the web.
- Create translucent graphics, overlay transparent vector objects on bitmaps, and vary the levels of opacity.
- Easily morph, or change, any graphic across any number of frames.
- Create applications like animated buttons, checkboxes, hierarchical and pop-up menus.



SAVE OVER **\$750**

MAC090 Macromedia Dream Team

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MAC052 Dreamweaver

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MAC105 Fireworks

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MAC107 Flash3

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Use Bryce 3D to animate just about anything in your scene. Start with hundreds of pre-set surfaces, objects and materials to add and animate realistic textures inside objects. Show clouds blowing within bubbles, molten lava spilling from craters or smoke swirling in beams of light. Bryce 3D is flat out the easiest tool for creating and animating 3D environments that mimic the natural world

Features:

- Click to select from built-in object and material libraries
- Customise or Import objects you create in other 3D modelling tools
- Export to most popular formats, including QuickTime and AVI movies
- Fast animation preview and QuickDraw 3D give you real-time feedback as you edit.



MET027 Kai's Power Tools 5

\$329

KAI013 Bryce 3D

\$369

Painter 5.5 Web Edition

A Powerful Digital Painting Tool for Creative Professionals. Indispensable for developing unique web content, Painter 5.5 Web Edition can produce hot looks fast. • Divide your images with precision to optimise download time of graphics • Create buttons with a single click • Design seamless tiled background patterns in an instant. • Compose and control text and assign URL's to any floating object. • Jump start your website with hundreds of ready made buttons, objects, photos, textures and patterns.

Web-Ready Content:

- 600+ Web buttons
- 300+ objects
- 250+ horizontal rules
- 325+ additional textures and patterns
- 100+ royalty-free photos

File Format Support:

- RIFF (Painter Native)
- TIFF, GIF, JPEG
- PICT, BMP, PCX
- TARGA, EPS, PYRAMID
- PhotoShop 2 & 3



MET002 Poser 3

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MET003 Poser 3 upgrade

\$199

MET025 Painter 5.5 Web Edition

\$549

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The Ultimate Plugin. Create and Explore Touchable 3D Surfaces
Extend the power of your image editor today!

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Zap

BladePro offers custom textures, zoomable previews, new light sources, mutation, and more. BladePro comes complete with

- Hundreds of Presets
- Heaps of Tutorials
- Online Links
- Tons of Textures
- Associated graphics tools to evaluate and more...

With BladePro you can quickly create:

- tarnished copper
- dirty brass
- reflective glass blobs with rainbow caustics
- chrome text that reflects its environment
- oxidized metal with iridescent colours
- cracked paint
- eroded mud
- scaly plastic
- glittery aluminium
- rough stone
- your logo embossed into gold foil and much much more...



Stock Code: COM105

\$69

Paint Shop Pro

The Versatile Image Design Studio

Paint Shop Pro 5 is a complete image creation and manipulation program that enhances the imaging power of business and home users with unrivaled ease of use, speed and affordable functionality.

To express your self with rich and arresting imagery, you need tools that offer innovative functionality and the flexibility to work in any setting without slowing you down.

Whether you need to design corporate Web graphics or touch up a family photograph, Paint Shop Pro is the perfect program to express and enhance your visual creativity.

**BONUS
FREE SOFTWARE
Animation Shop -
a fully featured
GIF Animator.**

New Features

- **Layers, Layers and More Layers**
Complete layer support has been added. Layer functionality has been added to blend mode control, names, grouping, visibility, transparency locking, user masks, variable opacity, and mask looking.
- **Multi-level Undo**
Change your mind at any time with PaintShop Pro's multi-level undo. There is even an undo history log.
- **Picture Tubes**
The cool new Picture Tube feature gives you a host of stunning graphics at your fingertips, that can be added to any image.
- **FreeForm Deformations**
Deform your graphic on the run with the new Free form tool.
- **Retouch Brushes**
Retouch brushes now include dodge, burn, saturation, hue, lightness, and HSL to target modes.
- **Enhance browser makes it even easier to find your files.**
- **CMYK separations**
Printing four colour separations is now available.

Perfect for graphic artists and pre press processing

- **Pressure Sensitive Tablets**
Paint Shop Pro 5 now includes pressure sensitivity for graphics tablets
- **ICM2.0 for Win98/NT5**
Device independent colour management will be supported for Win 98 and NT 5.0. This will allow for consistent colour reproduction across devices such as scanners, monitors, printers.
- **Brush Palette**
Additional brush settings along with an easy to use brush palette with preview window.
- **Custom Brushes**
The Custom Brush feature allows for use of user defined brushes. A database of custom brushes can be created to store the brushes. The custom brushes created are compatible with Photo Shop's custom brushes.
- **Adjustable Cropping**
An adjustable crop tool has been added allowing for a more precise control of the cropping procedure.



Paint Shop Pro

Stock Code: JAS009

\$135

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HiTozo... **\$69⁹⁵**

For professional video editing, take a look at the Studio 400 on p43

Tamzin



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Category Index

Accounts	10,11
Business Development	13
Business	16,17
CAD	24,25
Communication	26,27
Digital Cameras	40
Graphics Cards	42,43
Graphics/DTP Software	18-23
Internet	40,41
Microsoft	3,8,9
Modems	44,45
Networking	47
Notebooks	4
OCR	34,36
PCs	5
Printers	6,7
Reference/Training	12
Scanners	35,36,37
Storage	37-39
Tape Backup	46
UPS	46
Utilities	26-31
Video Capture	40,42,43
Voice Recognition	14,15,17
Y2K	32,33

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Features:

- 1. The Powerful Browser** - Stop shuffling CD's! Search and view thumbnail images of the entire CD collection of over 500,000 images from two navigation CDs. You supply the keywords, the browser pin-points the perfect image fast. With other collections, if it at all exists, the right image is just a needle in haystack! Or access over 500,000 other images online.
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PowerPoint	80,000	61,000	41,000	0
MasterPhotos	40,000	31,000	20,000	18,000
Web Art	2,100,000	54,000	18,000	0
MasterPhotos Objects	2,000	400	400	0
MasterFonts	Yes	2,000	2,000	2,000
Sounds	Yes	8,000	500	500
Video & Animations	Yes	180	20	20
Browser	Yes	Yes	Yes	Yes
Editor	Yes	Yes	Yes	Yes
3D Art	Yes	Yes	Yes	Yes
	IMS106 ...\$139	IMS105 ...\$119	IMS104 ...\$89	IMS102 ...\$69

MasterClips Publisher V3

Create it at Home!

Publishing from home or your office? It's both easy and fun with MasterClips Publisher. Wizards and templates walk you from layout to finish. Or you can create your project entirely from scratch. Either way, you have access to the MasterClips award winning collection, as well as the powerful tools of desktop publishing. So, whether for print or the Web, MasterClips Publisher is all you need to make any document attractive and effective.

Key Features:

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- Avery Label Templates
- 2,000+ fonts
- Professionally designed templates
- 3D Power Text
- Frame, Text, & Picture Rotation
- Web Publishing



- Mail Merge
- Microsoft/Office Compatible
- Complete Set of Drawing & Layout Tools
- Photo, Art & Text Editing

IMS145 MasterClips Publisher V3

\$79

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Premium Images For Stunning Web Sites.

MasterClips Web Art provides you with the highest quality Web-ready images available so you can easily create professional looking Web pages. Whether you are a beginning Web designer or a pro, MasterClips Web Art gives you the professional results you need fast. Choose from thousands of clip art and photo images for specific uses or create a consistent look throughout your entire Web sites with exclusive Matching Sets. MasterClips Web Art's easy to use browser lets you view images how they would appear on the Web.



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IMS134 MasterClips Web Art

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CorelDRAW 8 Productivity, Power and Precision!

Get a \$199 Wacom Pen Partner - FREE!

Exceed the boundaries of traditional design with CorelDRAW 8. Created for the professional illustrator, graphic artist and desktop publisher CorelDRAW 8 leaps ahead offering sophisticated features and tools required by professionals. CorelDRAW 8 is a comprehensive 32-bit graphics suite designed for Windows 95 and Windows NT 4.0. Building on the strength of its award-winning predecessors, CorelDRAW 8 is feature rich and streamlined for optimum performance. This suite includes tools for illustration, page layout, painting, photo editing, and 3D modeling and rendering. Several utilities are included to provide support for scanning, tracing, OCR, font management, screen capture, OLE scripting and more. Completing the suite are over 40,000 clipart images, over 1,000 TrueType and Type 1 fonts, plus hundreds of photos, Web backgrounds, animated GIFs, templates and more.

CorelDRAW 8 includes:

- CorelDRAW 8
- Corel PHOTO-PAINT 8
- CorelDREAM 3D 8
- Corel OCR-TRACE 8
- Corel TEXTURE
- CorelSCAN
- Corel CAPTURE 8
- Corel SCRIPT Editor and Corel SCRIPT Dialog Editor
- Bitstream Font Navigator 3.0
- Corel Versions

New Features include:

- Streamlined Controls
- Intuitive Behaviour
- Enhanced Tools
- Fill/Outline and Color
- Improved Connectivity
- Powerful Internet Capabilities
- Improved object placement
- Customizable Zoom
- IntelliMouse support
- Additional keyboard support with new hot-key combinations
- Enhanced Color Support

Plus buy CorelDRAW 8 full version or upgrade now and receive a \$199 WACOM pen partner absolutely free!*

The WACOM pen partner is an electronic pen you write with on a pen partner to translate movement to your PC screen rather than using a mouse. It's as easy to use as a pencil, crayon, paint brush or piece of chalk!

* Limited offer. Shipping & Handling fee applies. Promotion ends March 31st.



COR268 CorelDRAW 8 U/G.....

\$439

COR267 CorelDRAW 8.....

\$859

Corel Gallery Magic 1,000,000

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Add excitement to any project with Corel GALLERY Magic 1,000,000. Find images with the new browser/search engine and alter them with powerful photo-editing tools. With over one million images* to choose from, this collection is ideal for Web pages, newsletters, flyers and more!



Includes:

- 800,000 Web images*
- 140,000 vector clipart images*
- 60,000 photos
- 1,000+ fonts
- 530+ sounds
- 125 videos
- Plus... Corel Photo House 2.1 Touch up, alter or enhance your Corel GALLERY™ 1,000,000 digital images

* Note: Includes over 825,000 images new to this product plus over 175,000 images from Corel GALLERY Magic 200,000. Web browser required.

COR541 Corel Gallery Magic.....

\$169

CorelDRAW Select Edition



Ideal for both simple and complex projects, this exceptional graphics suite gives you the tools you need for breathtaking results. Take advantage of CorelDRAW 7 and Corel PHOTO-PAINT 7 for graphic design, photo editing, special effects, illustration and page layout. A property bar that changes to suit the task at hand and a customizable user interface let you edit icons, arrange toolbars and toolboxes-and more. CorelTUTOR and context-sensitive Hints give you help when you need it. Plus, interactive tools and utilities provide onscreen feedback, making the design process much more intuitive.

COR542 CorelDRAW Select Edition

\$89

Corel Print House Magic Deluxe



An easy-to-use graphics package with everything you need to create hundreds of home and business projects. Create sensational greeting cards, online postcards, calendars, banners, flyers, signs and more. Touch up or alter your favourite photographs and digital images using Corel Photo House 2. Keep track of addresses and special events using Corel Family & Friends. With over 100,000 graphics, access to animated online greetings, and free samples of specialty paper from Hewlett-Packard included in the box, Corel Print House Magic Deluxe unleashes your creative power!

COR525 Corel PrintHouse Magic Deluxe

\$99

PINNACLE STUDIO DCIO PLUS



The Studio DCIO Plus is an easy to use PC video editing system. Using Microsoft DirectShow software, the Studio DCIO Plus lets you preview your edits without rendering. So, when you make changes to your movie, you can view the changes instantly in a Preview Window. And when you are ready to finish your movie, Studio DCIO Plus saves you even more time and drive space by only rendering the scenes that you have altered. And as the Studio DCIO Plus overcomes the zGB Video for Windows file size limitation, you can make longer movies than you can with other desktop video editing solutions. Studio DCIO Plus gives both Composite and S-video inputs and outputs, allowing you to capture and output your video with VHS, S-VHS, 8mm and Hi-8 units. You can then output to CD-ROM, videotape, the Internet or even into Powerpoint presentations.

PIN024 Studio DCIO Plus

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Floor, 93rd Floor, 94th Floor, 95th Floor, 96th Floor, 97th Floor, 98th Floor, 99th Floor, 100th Floor, 101st Floor, 102nd Floor, 103rd Floor, 104th Floor, 105th Floor, 106th Floor, 107th Floor, 108th Floor, 109th Floor, 110th Floor, 111th Floor, 112th Floor, 113th Floor, 114th Floor, 115th Floor, 116th Floor, 117th Floor, 118th Floor, 119th Floor, 120th Floor, 121st Floor, 122nd Floor, 123rd Floor, 124th Floor, 125th Floor, 126th Floor, 127th Floor, 128th Floor, 129th Floor, 130th Floor, 131st Floor, 132nd Floor, 133rd Floor, 134th Floor, 135th Floor, 136th Floor, 137th Floor, 138th Floor, 139th Floor, 140th Floor, 141st Floor, 142nd Floor, 143rd Floor, 144th Floor, 145th Floor, 146th Floor, 147th Floor, 148th Floor, 149th Floor, 150th Floor, 151st Floor, 152nd Floor, 153rd Floor, 154th Floor, 155th Floor, 156th Floor, 157th Floor, 158th Floor, 159th Floor, 160th Floor, 161st Floor, 162nd Floor, 163rd Floor, 164th Floor, 165th Floor, 166th Floor, 167th Floor, 168th Floor, 169th Floor, 170th Floor, 171st Floor, 172nd Floor, 173rd Floor, 174th Floor, 175th Floor, 176th Floor, 177th Floor, 178th Floor, 179th Floor, 180th Floor, 181st Floor, 182nd Floor, 183rd Floor, 184th Floor, 185th Floor, 186th Floor, 187th Floor, 188th Floor, 189th Floor, 190th Floor, 191st Floor, 192nd Floor, 193rd Floor, 194th Floor, 195th Floor, 196th Floor, 197th Floor, 198th Floor, 199th Floor, 200th Floor, 201st Floor, 202nd Floor, 203rd Floor, 204th Floor, 205th Floor, 206th Floor, 207th Floor, 208th Floor, 209th Floor, 210th Floor, 211th Floor, 212th Floor, 213th Floor, 214th Floor, 215th Floor, 216th Floor, 217th Floor, 218th Floor, 219th Floor, 220th Floor, 221st Floor, 222nd Floor, 223rd Floor, 224th Floor, 225th Floor, 226th Floor, 227th Floor, 228th Floor, 229th Floor, 230th Floor, 231st Floor, 232nd Floor, 233rd Floor, 234th Floor, 235th Floor, 236th Floor, 237th Floor, 238th Floor, 239th Floor, 240th Floor, 241st Floor, 242nd Floor, 243rd Floor, 244th Floor, 245th Floor, 246th Floor, 247th Floor, 248th Floor, 249th Floor, 250th Floor, 251st Floor, 252nd Floor, 253rd Floor, 254th Floor, 255th Floor, 256th Floor, 257th Floor, 258th Floor, 259th Floor, 260th Floor, 261st Floor, 262nd Floor, 263rd Floor, 264th Floor, 265th Floor, 266th Floor, 267th Floor, 268th Floor, 269th Floor, 270th Floor, 271st Floor, 272nd Floor, 273rd Floor, 274th Floor, 275th Floor, 276th Floor, 277th Floor, 278th Floor, 279th Floor, 280th Floor, 281st Floor, 282nd Floor, 283rd Floor, 284th Floor, 285th Floor, 286th Floor, 287th Floor, 288th Floor, 289th Floor, 290th Floor, 291st Floor, 292nd Floor, 293rd Floor, 294th Floor, 295th Floor, 296th Floor, 297th Floor, 298th Floor, 299th Floor, 300th Floor, 301st Floor, 302nd Floor, 303rd Floor, 304th Floor, 305th Floor, 306th Floor, 307th Floor, 308th Floor, 309th Floor, 310th Floor, 311th Floor, 312th Floor, 313th Floor, 314th Floor, 315th Floor, 316th Floor, 317th Floor, 318th Floor, 319th Floor, 320th Floor, 321st Floor, 322nd Floor, 323rd Floor, 324th Floor, 325th Floor, 326th Floor, 327th Floor, 328th Floor, 329th Floor, 330th Floor, 331st Floor, 332nd Floor, 333rd Floor, 334th Floor, 335th Floor, 336th Floor, 337th Floor, 338th Floor, 339th Floor, 340th Floor, 341st Floor, 342nd Floor, 343rd Floor, 344th Floor, 345th Floor, 346th Floor, 347th Floor, 348th Floor, 349th Floor, 350th Floor, 351st Floor, 352nd Floor, 353rd Floor, 354th Floor, 355th Floor, 356th Floor, 357th Floor, 358th Floor, 359th Floor, 360th Floor, 361st Floor, 362nd Floor, 363rd Floor, 364th Floor, 365th Floor, 366th Floor, 367th Floor, 368th Floor, 369th Floor, 370th Floor, 371st Floor, 372nd Floor, 373rd Floor, 374th Floor, 375th Floor, 376th Floor, 377th Floor, 378th Floor, 379th Floor, 380th Floor, 381st Floor, 382nd Floor, 383rd Floor, 384th Floor, 385th Floor, 386th Floor, 387th Floor, 388th Floor, 389th Floor, 390th Floor, 391st Floor, 392nd Floor, 393rd Floor, 394th Floor, 395th Floor, 396th Floor, 397th Floor, 398th Floor, 399th Floor, 400th Floor, 401st Floor, 402nd Floor, 403rd Floor, 404th Floor, 405th Floor, 406th Floor, 407th Floor, 408th Floor, 409th Floor, 410th Floor, 411th Floor, 412th Floor, 413th Floor, 414th Floor, 415th Floor, 416th Floor, 417th Floor, 418th Floor, 419th Floor, 420th Floor, 421st Floor, 422nd Floor, 423rd Floor, 424th Floor, 425th Floor, 426th Floor, 427th Floor, 428th Floor, 429th Floor, 430th Floor, 431st Floor, 432nd Floor, 433rd Floor, 434th Floor, 435th Floor, 436th Floor, 437th Floor, 438th Floor, 439th Floor, 440th Floor, 441st Floor, 442nd Floor, 443rd Floor, 444th Floor, 445th Floor, 446th Floor, 447th Floor, 448th Floor, 449th Floor, 450th Floor, 451st Floor, 452nd Floor, 453rd Floor, 454th Floor, 455th Floor, 456th Floor, 457th Floor, 458th Floor, 459th Floor, 460th Floor, 461st Floor, 462nd Floor, 463rd Floor, 464th Floor, 465th Floor, 466th Floor, 467th Floor, 468th Floor, 469th Floor, 470th Floor, 471st Floor, 472nd Floor, 473rd Floor, 474th Floor, 475th Floor, 476th Floor, 477th Floor, 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Floor, 1159th Floor, 1160th Floor, 1161st Floor, 1162nd Floor, 1163rd Floor, 1164th Floor, 1165th Floor, 1166th Floor, 1167th Floor, 1168th Floor, 1169th Floor, 1170th Floor, 1171st Floor, 1172nd Floor, 1173rd Floor, 1174th Floor, 1175th Floor, 1176th Floor, 1177th Floor, 1178th Floor, 1179th Floor, 1180th Floor, 1181st Floor, 1182nd Floor, 1183rd Floor, 1184th Floor, 1185th Floor, 1186th Floor, 1187th Floor, 1188th Floor, 1189th Floor, 1190th Floor, 1191st Floor, 1192nd Floor, 1193rd Floor, 1194th Floor, 1195th Floor, 1196th Floor, 1197th Floor, 1198th Floor, 1199th Floor, 1200th Floor, 1201st Floor, 1202nd Floor, 1203rd Floor, 1204th Floor, 1205th Floor, 1206th Floor, 1207th Floor, 1208th Floor, 1209th Floor, 1210th Floor, 1211th Floor, 1212th Floor, 1213th Floor, 1214th Floor, 1215th Floor, 1216th Floor, 1217th Floor, 1218th Floor, 1219th Floor, 1220th Floor, 1221st Floor, 1222nd Floor, 1223rd Floor, 1224th Floor, 1225th Floor, 1226th Floor, 1227th Floor, 1228th Floor, 1229th Floor, 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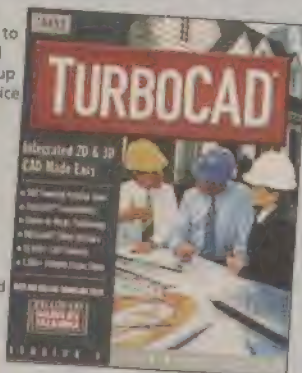
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Add real productivity to the time you spend designing as you draw with precision, render and edit in 3D, and share files with ease. TurboCAD Professional is the complete CAD solution that is familiar, compatible and fully programmable. TurboCAD Professional allows you to create drawings using state-of-the-art speech recognition technology. This powerful software recognises 300 CAD commands. TurboCAD Professional v5 is the only voice enhanced CAD application on the market. The most demanding design environments deserve powerful, accessible tools - the kind you will find right here in TurboCAD Professional!

Key Features:

- Full Featured 2D CAD
- Seamless 3D Integration
- Compatible With Your Design Environment
- Voice Recognition TurboCAD Programmability
- Tips and Tricks



\$449

IMS119 TurboCAD V5 Professional

Simplecomputing NetExpress 56 - SVD Data Fax Voice Modem



Using the Simplecomputing NetExpress 56 to connect to the Internet will open up endless communication and exploring opportunities. High speed Access 56K V.90 modems are the fastest on the market. The NetExpress 56 is powered by Rockwell technology and supports both K56flex and V.90 modem standards. The NetExpress 56 is flash upgradable to future 56K V.90 enhancements that can be quickly downloaded, keeping your modem forever fast. The NetExpress 56 comes with a free CD-ROM that offers you everything you need to get onto the internet, including a web browser offers from Australia's leading ISP's and email software.

Not just a super-fast surfing machine, the NetExpress 56 offers all the latest modem features:

- Fax
- Voice
- Speakerphone
- Simultaneous Voice and Data

Simple NetExpress 56K V90

\$189

Maria



All prices INCLUDE sales tax. Prices subject to change, see page 48 for terms & conditions.

Orderline 1300 300 003 or 02 9700 8800 Order by fax 02 9700 8801

Enquiries 02 9700 8800 Internet site www.iswh.com.au

13 Broadford Street
Alexandria
Sydney 2015

EVERYTHING FOR YOUR PC - DELIVERED NATIONWIDE!



KENS KORNER

This month I have heaps of fantastic bargains waiting to be snapped up. Some are previous versions, others have damaged packaging, but ALL carry full guarantees and warranties. Remember, there are limited stocks so call quickly.

Logitech Scanman 256

\$15

Sony Storstation 2Gb

\$249

Oxford Encyclopaedia

\$29

Visio v4

\$49

there are many more that I can't fit in here. For a full listing, check out my section on our website at www.iswh.com.au

See you next month!

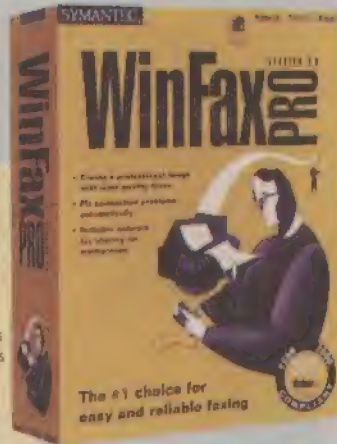
Ken



WinFax PRO 9.0

The world's #1 choice for hassle-free faxing!

SYMANTEC



With WinFax PRO 9.0

- Small businesses can look more professional by sending crisp laser-quality faxes.
- Workgroups can save money by sharing a fax modem and phone line through a non-designated fax host.
- It can also notify mobile users via pager or PCS cell phone as soon as an important fax arrives, or automatically forward faxes to another fax number or an e-mail address.

\$129

SYM191 WinFax PRO 9.0

TalkWorks PRO 2.0

Give your small business a professional voice

SYMANTEC



TalkWorks PRO 2.0 from Symantec brings professional voice and fax messaging to home offices and very small businesses. Its integrated capabilities keep you in touch with your customers 24 hours a day. Offer fax-on-demand to provide your customers with information at any time, and use the completely integrated faxing capabilities of WinFax PRO 9.0, the leading fax software from Symantec.

With TalkWorks Pro 2.0

- Set up separate mailboxes for employees, fax on demand, and other purposes.
- Get remote notification when a voice or fax message arrives.
- Track faxes and voice calls.
- TalkWorks PRO 2.0 even supports Caller ID*

*Caller ID service from telephone service provider and caller ID-capable modem required for some features.

\$219

SYM193 TalkWorks PRO 2.0

ACT!™ 4.0 SYMANTEC

Get ACT! Get Results!

Nobody knows your customers better than you do. The trick is remembering the right things about them at precisely the right time. ACT!™ 4.0 puts the information you need within easy reach - phone numbers, addresses, order history, even invoice dates.

• Leverage the Internet

ACT!™ 4.0 teams up with your Web browser to search services like WhoWhere, Yahoo, and Bigfoot. Find new customers and prospects - names, company names, and email addresses, then download them directly into your database.

• Stay connected online

If you want to see a client's Web site, you can store the URL and launch it right from within ACT!™ 4.0. Plus, you can contact people online with complete support for Internet email.

• Become a genius with details

Use new SideACT! To write names, numbers, appointments, and other important messages to yourself - all without launching ACT!™ 4.0. Later, you can transfer what you need over to ACT!™ 4.0 and still be completely organised.

• Manage every day more efficiently

ACT!™ 4.0 simplifies your life by putting all your daily essentials within easy reach - daily, weekly, and monthly calendars, a handy to-do list, even on-screen alarms.

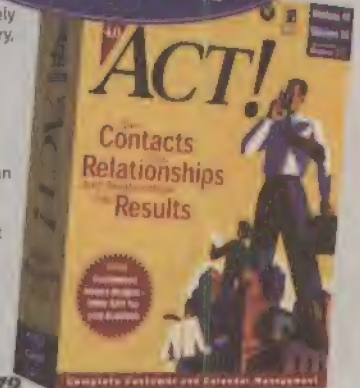
Features:

- Now includes business templates for major business across Australia
- Flexible customer database - Get started right away with 70 preset user fields
- Customise the database with your own fields, custom screens and on-line forms
- Work in form or list view
- Attach files, such as spreadsheets and documents, to your contacts

STOCK CODE: SYM179

\$149

Complete customer & calendar management



pcAnywhere™ 8.0

Easy remote access to PCs from anywhere, anytime!

pcAnywhere 32 for Windows 95 and Windows NT is the fastest, easiest way to remotely access PCs, applications, and information from a home or office PC or network. Make quick, easy connections via modem, network, or the Internet to check e-mail, remotely support clients, download files, or simply run remote applications. Expanded Internet support, with SmartList and advanced security options, allows you to easily and safely access your PC while saving on long-distance phone charges.

Features

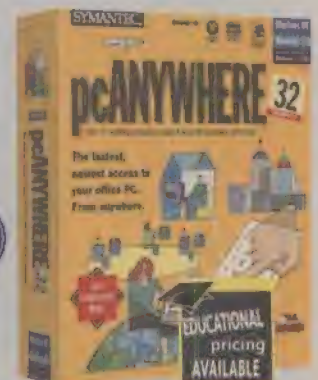
- Enhanced performance - 20% faster than previous versions, to increase productivity and minimise connection costs
- AutoXfer - Automatic file transfer and synchronisation quickly and easily provides you with the most current version of remote files
- ColorScale - Improves screen refresh rates so you can work faster
- SpeedSend - Transfer only the parts of the files that have changed. Fast
- Optimised desktop - Unique speed options disable host wallpaper, screen savers and full window dragging, for faster remote control

Saves you money on long-distance calls!

\$199

SYM170 pcAnywhere V8.0

SYMANTEC



All prices INCLUDE sales tax. Prices subject to change, see page 48 for terms & conditions.

26

For the cost of a local call

Orderline 1300 300 003 or 02 9700 8800

Sales Lines Open 9am 'til 6pm Monday to Friday and 10am 'til 3pm Saturday.



DON'T FORGET TO ASK FOR YOUR FREE GIFT

The only thing better than having so much information at your fingertips... is discovering the best ways to make use of it!

CD Phone Directory

Virtually every Australian Business & Residential Phone Directory at your fingertips!

Don't miss this amazing offer! This special edition of CD Phone Directory comes with a Bonus \$10 worth of free long distance phone calls... so you're getting CD Phone Directory for half price! Imagine how much easier and faster it would be if you had virtually every Australian business & residential telephone number on your own PC! Only DtMS CD Phone Directory puts Australia at your fingertips!



- ✓ Hurry, this limited edition includes a bonus \$10 worth of long distance phone calls!
- ✓ Gives instant access to over 8,000,000 business and residential listings across Australia!
- ✓ Search by Company Name, Line of Business, Surname & Initial, Suburb, State or Postcode!
- ✓ Provides you with the tools to find friends, relatives or all those people you've wondered about... easily and quickly!

FREE \$10 worth of long distance phone calls

DTM011 CD PHONE DIRECTORY... **\$19**

Wasting too much time on the road? Get LapLink Professional, and get productive.

LapLink Pro lets you work whenever and wherever it's convenient for you. When you need to share information between an office PC, a laptop, or your home PC while travelling or working away from the office, LapLink Pro will get you connected.

LapLink Pro sets the standard in usability and is the #1 rated choice for easy, speedy and reliable remote control and file transfer by mobile professionals and telecommuters. When you take a look at the features this product offers, it's no wonder that LapLink Pro is agreed upon by the experts to be the "best remote control access solution today".

- Print redirection from remote PC to local printer, or to a remote PC's printer.
- Optimised for Windows 98
- Supports USB cable for faster file transfer
- Includes bonus Windows CE remote control software
- Single mode operation - no need to set "guest" or "host" modes
- Adaptive compression automatically gives optimal speed over all connections
- Integrated scheduler for Windows 98, 95, NT
- Smart Install configures all devices automatically - no user intervention required
- Compatible with Windows 3.1, 95, 98, and NT



LapLink has won more awards than all of its competitors put together.



LAP011 LapLink Professional... **\$179**

LAP009 LapLink Technical... **\$279**

Phonedisc

With Search by Phone Number!

A powerful tool for finding what you want and who you want in seconds! Imagine the advantages of a telephone directory that not only gives you much more information, but gives it to you the way you want it! For businesses or home

use, Phone Disc provides a powerful tool for locating new clients, suppliers, friends, relatives or virtually anyone, anywhere with just a few easy keystrokes.

Features:

- ✓ Powerful reverse search capabilities
- ✓ Search by Name, Company, Initials, Surname, Suburb, state, Postcode or Line of Business
- ✓ Full Boolean search capability
- ✓ "Sounds-like" facility
- ✓ Auto dialer facility
- ✓ Contact sensitive on-line help
- ✓ Copy entries to the Window Clipboard
- ✓ And much, much more!

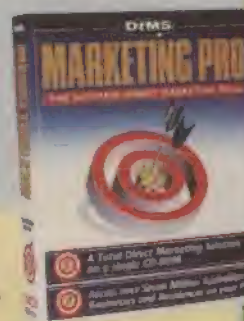


DTM001 Phonedisc... **\$89**

Marketing Pro The Comprehensive Direct Marketing Tool!

Put cost efficient and effective marketing at your fingertips! Make the most of your marketing dollar! Marketing Pro puts the ultimate Direct Marketing Tools in your hands. After all, no-one knows your product or your service better than you, so why not make the most of your market potential? Put Marketing Pro to work for you and you'll discover the most cost effective way to increase business!

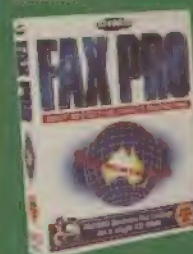
- ✓ Access over 8,000,000 prospective clients!
- ✓ Search for, locate and compile prospective leads and clients easily and quickly.
- ✓ Search and compile data by business type, city, address, phone number, postcode, Ad size, address, industry codes, state, regions, employee size, mobile-phone number and much more!
- ✓ Utilize powerful software functions that provide you with the tools to organise, select and compile data the way you need it.
- ✓ Take advantage of the most up-to-date and powerful data retrieval engine
- ✓ Query by example searching.
- ✓ Easy label and report printing.
- ✓ Easily eliminate duplications.
- ✓ Utilize Marketing Pro for the ultimate telemarketing facilities.
- ✓ Auto-dial and much, much more!
- ✓ Updates available quarterly



DTM003 Marketing Pro Melbourne	
DTM004 Marketing Pro Sydney	\$495
DTM005 Marketing Pro Brisbane	
DTM006 Marketing Pro Vic/Tas	\$595
DTM007 Marketing Pro NSW/ACT	\$595
DTM008 Marketing Pro QLD/NT	\$595
DTM009 Marketing Pro SA/WA/NT	\$595
DTM010 Marketing Pro National	\$1095

Fax Pro

Instant Sales For Your Business!



forget about hit and miss mail-outs - dial direct and reach your target market instantly!

Why waste time and money on expensive mail-outs when you can go directly to your target audience at the touch of a button? Put the power of direct marketing at your fingertips with FAX PRO!

- Access over 300,000 Australian & New Zealand business fax listings!
- Sophisticated searching techniques make fax-broadcasting a breeze
- Locate, organise, file or print your search criteria easily, quickly and in the format that's most appropriate for your application.
- Compile, Tag, File, Print and fax-queue virtually any way you want.
- Combine and sort sets easily and quickly!
- Isolate and locate the businesses that need your service or product and contact them quickly and cost effectively.

Fax ProDTM002

\$275

Ali



All prices INCLUDE sales tax. Prices subject to change, see page 48 for terms & conditions.

Orderline 1300 300 003 or 02 9700 8800 Order by fax 02 9700 8801

Enquiries 02 9700 8800 Internet site www.iswh.com.au

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EVERYTHING FOR YOUR PC - DELIVERED NATIONWIDE!

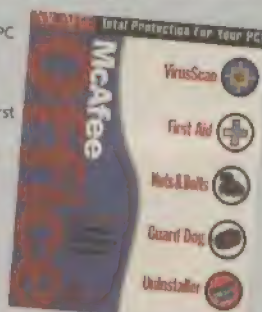
SOMETHING FOR EVERY PC.....Category
Index

Accounts	10,11
Business Development	13
Business	16,17
CAD	24,25
Communication	26,27
Digital Cameras	40
Graphics Cards	42,43
Graphics/DTP Software	18,23
Internet	40,41
Microsoft	3,8,9
Modems	44,45
Networking	47
Notebooks	4
OCR	34,36
PCs	5
Printers	6,7
Reference/Training	12
Scanners	35,36,37
Storage	37-39
Tape Backup	46
UPS	46
Utilities	26-31
Video Capture	40,42,43
Voice Recognition	14,15,17
V2K	32,33

Mcafee Office**One solution for every PC problem!**

Office is the latest addition to the McAfee family of products. Designed to keep your PC running at optimum performance McAfee Office offers the PC user everything they could possibly need to maintain a healthy system. With full versions of VirusScan 4, First Aid 98, Nuts & Bolts 98, Guard Dog, Uninstaller, Year 2000 Toolbox, Oil Change, and Hurricane - McAfee Office offers over \$600.00 worth of value for only \$169.00.

Stock Code: MCA075

\$169**Virus Scan Version 4.0**

Detect and Destroy ALL viruses. McAfee Macro Hunter technology safeguards your PC from all virus types and from all potential sources. Virus Scan stops destructive Active X and Java applets often downloaded from the Internet. It scans all your e-mail attachments right inside your mailbox, so viruses never reach your system. SecureCast prepares you by using Internet "Push" technology to deliver virus updates directly to your desktop, automatically for the life of the product.

Stock Code: MCA070

\$69**UnInstaller Deluxe****Create More Disk Space ...Automatically!**

No matter how much hard disk space you have, it never seems to be enough. You have old programs, files downloaded from the Internet, files left behind from programs - all adding up to clutter your PC. With Uninstaller, you can get rid of the junk files and programs on your PC, safely and thoroughly. The result is a cleaner, smoother-running hard drive!

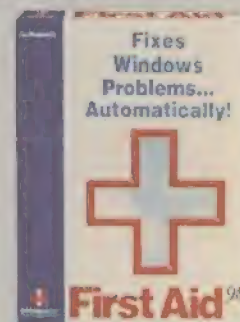
Stock Code: UN1009

\$85**First Aid 98****Fixes more Windows problems more automatically than any other software**

What First Aid will do for you!

- Warn you in advance of hard drive failure
- Correct tens of thousands of known problems and help keep your PC conflict free
- Take the risk and hassle out of adding new programs and multi-media cards
- Search the internet to find the latest solutions
- Act as your, personal 24 hour technical support expert

Stock Code: RMC211

\$65**System Commander**

As easy as changing channels on your TV, you can now switch between operating systems on your PC.

System Commander lets you run up to 100 different operating systems all on the same PC - without giving up your current operating system - without using any resident memory - with just a click of a button! Plus, System Commander's multi-user security system protects access to your computer!

Stock Code: VC0001

\$119**Nuts&Bolts98**

Nuts&Bolts98 - It's everything you need to clean, optimize, monitor and analyse your PC system and software.

- Efficiently manage and secure your data, and swiftly recover from a disaster.
- Prevent crashes and correct system problems - automatically - before they occur.
- Customise Windows98 to really work for you.
- NEW enhancements boost your PC's performance - from launch acceleration to disk defragmentation.
- NEW Year 2000 technologies prepare you for the next millennium.

Stock Code: MCA054

\$89**Dr Solomons Anti-Virus**

Dr Solomon's Anti-Virus is the only anti-virus product available in Australia that is able to automatically detect and eliminate over 17,000+ known viruses that are out there, ready to attack your PC. With over 3 million users worldwide. 24 hour, 7 day technical support and on-line upgrades for killing new viruses it's no wonder Dr Solomon's is trusted by over 3 million people worldwide. It's the world's most advanced, trusted and widely used anti-virus program.

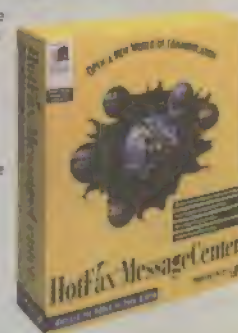
*Computer viruses are increasing at the rate of 300+ per month.

Stock Code: NIT005

\$79**HotFax MessageCentre**

Transform your PC and voice mail compatible modem into a sophisticated communications centre. Whether you're at home, in the office, or on the road, you can customize cover pages and send faxes with ease, add high-tech telephone capabilities to your computer, and remotely access your PC for the retrieval of faxes, files and voice mail. You can link your pager to your PC to ensure you're always in touch, send voice e-mail over the Internet, and much, much more.

Stock Code: SMS002

\$79

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FIND IT CHEAPER? CALL US - WE WON'T BE BEATEN!*

Norton SystemWorks™ 1.1

Norton SystemWorks™ offers five award-winning, integrated utility products, plus a Bonus Pack.

Norton SystemWorks™ is the first fully integrated, comprehensive utility suite, comprised of five award-winning Symantec products, plus a Bonus Pack. These state-of-the-art products work together to both fix and prevent system problems.

- Norton AntiVirus™ 5.0 – offers the world's most popular and most powerful anti-virus capabilities – including the ability to isolate infected files before they can damage your system.
- Norton Utilities™ 3.0 – is the industry leader in detecting, repairing, and preventing hardware and software problems. It also optimises your computer to run at peak efficiency.
- Norton CleanSweep™ 4.5 – recovers disk space by safely and completely removing unnecessary programs and files.
- Norton CrashGuard™ 4.0 – automatically protects against system crashes and screen freezes. It not only minimises the chances of a crash, but in most cases lets you save your work if a crash occurs.
- Norton Web Services™ – is an online service that keeps your system running smoothly by giving you easy access to the latest virus definitions, hardware drivers, and software updates.

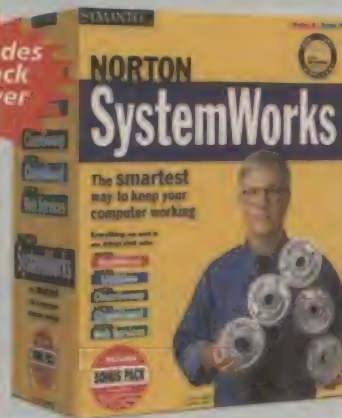
The Bonus Pack includes:

- Norton 2000™ – to make your PC and data "millennium ready".
- Norton Mobile Essentials™ – resolves laptop connection problems.
- WinFax™ Basic Edition sends and receives faxes directly from your computer.
- Symantec Visual Page™ – a web development tool.

SYMANTEC.



\$169



**Now includes
bonus pack
worth over
\$500**

Norton AntiVirus™ 5.0 Gold Edition

**YEAR 2000
COMPLIANT**

Norton AntiVirus™ from Symantec is the #1 anti-virus software in the world.

New features in version 5.0 let you quarantine infected files, easily get help with viruses directly from Symantec researchers, and it automatically protects you against viruses as well as malicious ActiveX and Java applets.

- Quarantine an infected file, and it's safe to store on your computer without fear of spreading the virus. The new Scan and Deliver wizard makes it easy to send quarantined and other suspicious files to Symantec for evaluation. The virus experts at the Symantec AntiVirus Research Center (SARC) will reply swiftly with helpful advice and any needed anti-virus definitions.
- With version 5.0, the software can also detect dangerous forms of ActiveX code, Java applets, and Trojan horses, giving you the industry's most complete protection against malicious code.
- Bloodhound technology uses advanced heuristic logic to "sniff out" and eliminate new viruses even without updated virus definitions.

As always, Norton AntiVirus can run constantly in the background to keep your computer safe from viruses that might come in from e-mail attachments, Internet downloads, floppy diskettes, software CDs, or a network. And it can be scheduled to automatically retrieve new anti-virus definitions from Symantec as often as once a week.

NOR090 Norton AntiVirus Gold v5

\$85

SYMANTEC.



Norton 2000

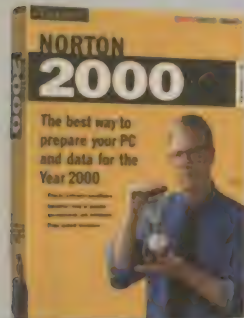
Prevent damage to your company's desktop PCs and data from Year 2000 problems.

In assessing Year 2000 exposure, don't forget that date anomalies in desktop PCs or applications can cause local problems or spread to the mainframe.

Norton 2000 gives you an easy, reliable, and flexible way to address Year 2000 anomalies at the desktop level, in applications, and in system clocks and BIOS.

Features:

- Finds Y2K anomalies in desktop applications.
- Tests and fixes system BIOS and clocks.
- Automatically updates database of Y2K compliant software.
- Supports central installation and administration.
- Provides flexible scanning/reporting options.



NOR086 Norton 2000

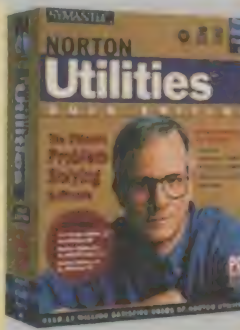
\$69

Norton Utilities Gold Edition

**Unrivalled problem solving power.
Unrivalled Control**

Proving again there's no substitute for experience, now Norton introduces the most powerful set of utilities ever created.

- The #1 problem-solving software for over fifteen years
- The industry leader in detecting, repairing and preventing major and minor computer problems
- Optimises your computer to run at peak efficiency
- Detects Windows problems in the background and provides intelligent repair
- Prevent crashes and screen freezes three times as effectively as any competing product
- Detects viruses and repairs infected files
- Lets you customise operations, or set Norton Utilities to work continuously
- Downloads the latest application patches and drivers over the Internet



NOR077 Norton Utilities Gold Edition

\$99

**SYMANTEC
VALUE LICENCE
PROGRAM
SAVE TIME AND
MONEY**

**SYMANTEC.
VALUE LICENCE
PROGRAM**

The Symantec Value Licence Program has been designed to make purchasing Symantec products quicker and cheaper. Just one phone call to our sales team could get you significant discounts for your organisation. Reordering is then a simple case of calling us and quoting the number from your certificate.

Designed for companies and organisations ordering more than 10 licenses, the Symantec Value License Program ensures you get the discounts you deserve.

**YES! WE SELL
NORTON GHOST
Call for details**

Joanne



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EVERYTHING FOR YOUR PC - DELIVERED NATIONWIDE!

Fandango



Fandango is the fast, fun way to create screensavers of all kinds for Windows 95. All the complex work is already done for you, just load some images, choose a style and adjust the simple, easy to understand controls and go! It's quick and easy to learn and requires absolutely no programming. Once you have finished your masterpiece you can install it on your own system or save it as a standalone project for other to use.

You can make screensavers for your own pleasure, for the company network or for distribution for promotion or profit - there are no royalties to pay.

Fandango COMIO3

\$45

**PartitionMagic 4.0**

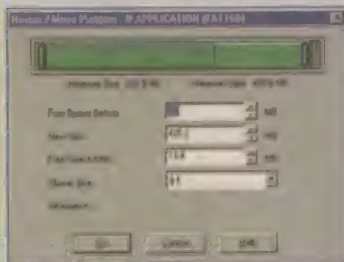
Reclaim up to 40% of your hard disk & organise your hard drive!

Reclaim Wasted Disk Space

Everyone wants to get the most they can out of their hard disk. But, up to 40 percent of your hard disk may be totally wasted due to inefficient storage methods. PartitionMagic 4.0 increases your usable disk space by shrinking large FAT partitions and restructuring cluster sizes to reclaim up to hundreds of megabytes of lost disk space.

Safely Run Multiple OS's

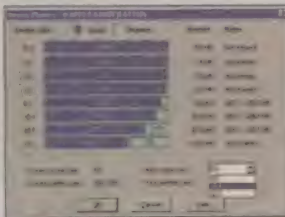
PartitionMagic 4.0 makes it easy to run multiple operating systems on the same machine without compatibility problems. Explore the new world of Windows 95, 98 or NT while still relying on the security of your current operating system. And PartitionMagic 4.0 includes BootMagic from IBM, making it easy to select an operating system every time you boot your computer.



Create, resize and delete partitions with the drag of a mouse.

Organise and Protect Data

Create a physically separate partition for your valuable data files to protect them from potentially unstable applications. This simplifies backups, especially to devices like ZIP™ drives. And with the transport feature of Uninstaller™, PartitionMagic 4.0 lets you easily move applications from one partition to another with their files and operating system settings in place.

**WHAT THE PRESS SAY...**

"Unique, dazzling and indispensable, PartitionMagic is a must have product in an era of larger and larger hard disks".
PC Magazine

PartitionMagic
HARD-DISK PARTITIONING FOR THE PC



POW034 PartitionMagic 4.0

\$99

POW033 PartitionMagic 4.0 Upgrade

\$59

Now with
BootMagic included!

WristGliders™

What are WristGliders™?

WristGliders™ are a revolutionary ergonomic wrist support which can minimise or eliminate the effects of R.S.I. The cushioned circular vinyl platforms glide independently with each hand to provide comfort, flexibility, and proper wrist alignment while using the keyboard and mouse.

WristGliders™ are engineered specifically to provide a new level of comfort and convenience for anyone who uses a computer keyboard or mouse. They're large enough to provide excellent support, yet small enough to be completely portable and unobtrusive.

And thanks to an innovative design that allows them to glide freely over your desktop, WristGliders™ deliver the kind of constant, uninterrupted support medical professionals recommend. WristGliders™ are proven to reduce the stress in your back, shoulders, neck, and arms. With WristGliders™, you'll work relaxed and be more productive than ever before.

So whether you currently suffer from R.S.I. or not, you owe it to yourself to try WristGliders™, the medically proven solution that's affordable, effective, and comfortable.

How to use WristGliders™

1. Place WristGliders™ felt side down on the work surface at the base of your computer keyboard.
2. Rest the outside of each wrist comfortably on the centre of each WristGlider.
3. Relax your neck, shoulders, arms, and hands.
4. To accommodate normal hand and arm movements, allow WristGliders™ to glide freely over the work surface.

Because most people lift their arms and wrists off typical wrist rests as they keyboard and navigate with a mouse, wrist rests simply cannot offer the kind of constant support medical professionals recommend. WristGliders™ glide freely over your desktop to accommodate natural hand movements and provide comfortable, constant support.



CHK018 WristGliders 3-Pack (2 keyboard, 1 mouse)

\$29
\$15

CHK019 WristGliders Single Pack

All prices INCLUDE sales tax. Prices subject to change, see page 48 for terms & conditions.

For the cost of
a local call

Orderline 1300 300 003 or 02 9700 8800



FIND IT CHEAPER? CALL US - WE WON'T BE BEATEN!*

PKZip 2.6 The Original Compression Program

The growth of the Internet and the increased use of World Wide Web browsers are creating a greater need to compress data files. Saving disk space and saving on-line phone charges are big benefits of compressing data files with PKZIP.

PKZip 2.6 has been determined by PC Magazine Editor's Choice (03/98), as the best compression utility. "All the programs reviewed here will get the job done, but PKZIP delivered the best combinations of features."

PKZIP compresses files on average 50-70% with many large text and database files compressing well over 90%. PKZIP's simple point-and-click interface lets you easily compress one file, or all files on an entire hard drive, and store them in the .ZIP file. PKZIP 2.6 has the added feature of being able to create self-extracting files that span multiple diskettes.

Using PKWARE patented compression technology, PKZIP combines the best and fastest compression found in PKZIP with ease-of-use of a Windows program. PKZIP for Windows is compatible with Windows 95, Windows NT, Windows 3.1 and with .ZIP files created on other PKZIP platforms. Other platforms include DOS, OS/2 and OpenVMS for VAX and Alpha.

Use PKZIP Whenever You Are:

At Home - The Internet contains many .ZIP files you can access through a World Wide Web browser. PKZIP also lets you archive files such as the digitized family photo album or annual budget in .ZIP files, saving you space on your hard drive.

On the Road - Use .ZIP files when sending email, storing presentations, or transferring files between your office PC and your laptop.

At the Office - Network and system administrators save space on their servers and reduce traffic over the Intranet or corporate network using .ZIP files.



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much as 90%.**

WIN109 PKZip v2.6

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KEY BENEFITS

- Professional investment advice in simple English
- Manage stocks, personal finances, property, etc
- Track investments in any ASX listed company
- Download stock prices for fast, accurate analysis

MAU007 MAUS

Stockmarket Plus .. **\$169**

MAUS Stockmarket Plus..... "is ideal for both novice and experienced investors who require a package to keep track of their stockmarket investments

Seldom does a software package completely outclass competitors, offering users a clearly superior product in terms of sophistication, simplicity and obvious attention to detail"

Review of core software - Personal Investment Magazine, 1997

MAUS Stockmarket Plus..... "is specifically designed for monitoring a share portfolio and has the added advantage of providing analytical tools as well as keeping the records you need"

Review of core software - Editor of Money Section (SMH 17/9/97)

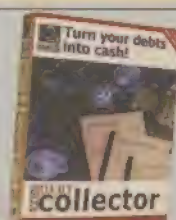
MAUS Debt Collector The complete debt collection system

MAUS Debt Collector is a complete debt collection system which automatically mail merges reminder and demand letters, reminds you of phone calls and action to take, and prompts you step-by-step through the entire debt collection process. To monitor your success, this revolutionary new product includes a unique graphing and reporting feature to quickly assess your current debtor position.

MAU009 MAUS Debt Collector..... **\$189**

KEY BENEFITS

- Reduce bad debts
- Cut collection time and costs
- Automatically sends 30, 60 and 90 day reminder letters
- Stand alone contact manager stores all debtor details
- Includes professional letters, legal documents & advice



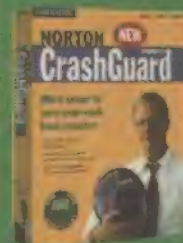
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Don't risk losing important documents and hours of work! Norton CrashGuard 4.0 gives you more power to save your work from crashes. It stops crashes from becoming major disasters by helping you save your open documents and get back to work quickly. In fact, you can usually resume your work without rebooting your system. The Crash Assistant feature guides you through each crash situation step by step - even offering multiple recovery options to maximise your chances of successfully saving your work. There's no better software than Norton CrashGuard for recovering from application crashes, application freezes and system crashes.

Norton CrashGuard 4.0
SYM99

\$39

Matthew



Y2K

INTERNATIONAL SOFTWARE WAREHOUSE Pty. Ltd.

EVERYTHING FOR YOUR PC - DELIVERED NATIONWIDE!

So you know what the millennium bug is. What next?

The Millennium Buster range has been developed to meet the standards as defined by the British Standards Institute Code of Year 2000 Conformity (DISC PD 2000-1). This code has been adopted word for word by Standards Australia and Standards New Zealand (SAA/SNZ MP77:1998), so you can buy with confidence.

TEST



Why pay for a Year 2000 fix if you don't need one? Use the Millennium Buster 1 test program to see if your PC is Year 2000 compliant. The Millennium Buster 1 test program will check ALL of a PC's time keeping components, including:

- Operating System Clock
- BIOS Chip
- Real Time Clock (RTC) Chip

It will test for Year 2000 compliance as well as testing for leap year recognition. At only \$29, can you afford not to test your PC?

So cleverly written it fits on one floppy disk!

Single User
MIL100

\$29

Multi User
Call for pricing

FIX



If you have performed the Millennium Buster 1 test, and have found that you need a software fix, then Millennium Buster 2 is the answer. Again, Millennium Buster 2 works with ALL PC time keeping components. There are very few programs that work with a computer's Real Time Clock. Millennium Buster 2 does, as well as working with leap year recognition. Installing new software? No problem. With the in built Re-Test option, you can check your PC as often as you like.

Single User
MIL101

\$99

Multi User
Call for pricing

CORPORATE



MBNET - the Millennium Buster Client Server program for experienced network administrators. MBNet contains both the test and the fix, which can be run on all workstations from the server. For more information, please call our Major Accounts team on 1 300 300 003.

5 User Client Server
MIL102

\$199

Call for extra user details

NEW HARDWARE FIX!

What if you want a hardware fix to make you Year 2000 compliant? You could spend \$3000 on a new PC, but it may not be compliant. You could spend \$700 on a new motherboard and processor, but again it does not guarantee compliance, and also means that you will have to re-install all your hardware, drivers etc. Or you could spend \$595 on the Millennium Buster Year 2000 Enhancement Card. The Year 2000 PC Enhancement Card is a highly sophisticated card that utilises the latest Dallas Semiconductor fully Year 2000 compliant Clock Chip. An ISA card that installs in most PCs in approximately 10 minutes, it is recommended for use in network servers and mission critical PCs.

MIL103 Millennium Buster PC Enhancement Card

\$595

Call for volume pricing

ATTENTION I.T. MANAGERS: Worried about the millennium bug and your network? Call our major accounts team on 1 300 300 003. Millennium Buster is used by many Blue Chip organisations.

YEAR 2000 - AN OPEN LETTER TO OUR VALUED CUSTOMERS

If you're confused, I'm not surprised. There is so much hype surrounding the year 2000 problem that it's often difficult to navigate your way to an honest conclusion. Briefly, let's start with what it's not: it's not a hoax. It's not being made up by the computer industry to sell more computers and software, and it's not exclusively the computer industry's problem. And it is certainly not going to go away.

As one of the leading mail order suppliers of PC Software and peripherals in both Australia and the UK, International Software Warehouse is committed to working with our customers in addressing the challenge of the Year 2000 millennium date change.

The challenge relates not only to shrink wrap software packages that are reliant on 4 digit short cut dates, but to the underlying IBM PC compatible hardware Bios (Real Time Clock CMOS) and Operating System compliance.

International Software Warehouse is currently working with its suppliers in following the guidelines set by Standards Australia and Standards New Zealand (SAA/SNZ MP77:1998), who have adopted the British Standard Institute's Document DISC PD 2000-1 verbatim. This code dictates that the onus is upon the manufacturers of computer software to ensure that the programs are compliant.

As part of our commitment to providing our customers with the very highest level of service, we have produced a free brochure explaining the implications of the Year 2000 challenge to small and large businesses alike. In the brochure you will find the necessary advice, tools, products and services with which your organisation can effectively implement Year 2000 risk assessment and compliance before December 1999. For a copy of the brochure, call our Major Accounts team on 1 300 300 003.

Phil Webb

Phil Webb
Managing Director
International Software Warehouse



Free brochure on the implications of the Year 2000 Challenge, and how to deal with them.



KENS KORNER

This month I have heaps of fantastic bargains waiting to be snapped up. Some are previous versions, others have damaged packaging, but ALL carry full guarantees and warranties. Remember, there are limited stocks so call quickly.

Logitech Scanman 256

\$15

Sony Storstation 26b

\$249

Oxford Encyclopaedia

\$29

Visio v4

\$49

There are many more that I can't fit in here. For a full listing, check out my section on our website at www.iswh.com.au

See you next month!

Ken



32

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FIND IT CHEAPER? CALL US - WE WON'T BE BEATEN!

CHECK 2000 PC Deluxe



The Ultimate tool for beating the Millennium Bug!

Check 2000 PC Deluxe is the only integrated year 2000 testing tool that addresses all five "at-risk" layers of your PC. You can correct the BIOS, test the operating system and software programs, scan your data files, and flag data importing issues.

CHECK 2000 PC Deluxe gives you more:

- ✓ Finds and corrects year 2000 hardware (BIOS) problems on the spot
- ✓ Flags problems in software programs, includes the world's largest database of remediation advice
- ✓ Lets you check new data from e-mail, internet, disks, CDs and other outside sources as often as you like
- ✓ Scans all the way down to individual cells in spreadsheets, databases, and other data files
- ✓ Helps you prioritize software and data problems for timely repair

"Today CHECK 2000 is established as the standard by which other year 2000 products are measured" Microsoft Y2K Resource Centre.

Greenwich Mean Time

STOCKCODE: GRE002

\$85

Greenwich Mean Time

1 Test and Correct BIOS

A simple pass/fail screen tells you if your BIOS passes or fails the critical date tests. Then Check 2000 PC Deluxe will correct the problems for you in 98% of BIOS types.

2 Check your operating System

Check 2000 will test your operating system, identify any 2-digit settings, and then recommend the changes you need to make. We check all of the popular operating systems, including: Win95/98, NT 4.0.

3 Analyse Software Programs

Every application treats date-dependent data a little differently.

Check 2000 PC Deluxe will do an inventory on your application programs - and show you which programs are most at risk (usually it's spreadsheets, databases, and schedulers). Year 2000 advice is provided on over 5,000 software programs. The knowledge base built into Check 2000 PC Deluxe recognises over 20,000 programs.

4 Pinpoint and Prevent Data Problems

Drill all the way down to the individual cells in spreadsheets- and other data files- that could cause problems. Correct the data as it's revealed to you by Check 2000, without switching between software programs. You can run the Data Scanner at any time, to continually reveal any new date-dependent data that comes into your PC.

5 Keep Checking Imported Data

Check 2000 PC Deluxe identifies software programs that import and export data. Then Data Scanner finds date-dependent data so you can correct it.

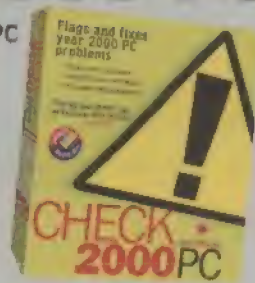
CHECK 2000 PC CHECK 2000 Client Server

Flags and fixes year 2000 PC problems

- Fixes your hardware
- Analyses your software
- Provides detailed advice

What CHECK 2000 PC does for you:

- Finds and eliminates hardware date problems in 98% of BIOS types by correcting the PC BIOS system clock.
- Tells you how your data and software will be affected by the year 2000 changeover.
- Gives advice on avoiding problems inherent in many thousands of popular software programs
- Helps you prioritise software and data problems for timely repair.



- Lets you run the program as many times as you like to keep monitoring your year 2000 status
- Provides free technical support for 90 days
- Compatible with Win 3.1/3.11, Win 95, Win NT 3.x, Win NT 4.0.

\$75

GRE001 Check 2000 PC

Scans your network to find and fix Year 2000 PC problems

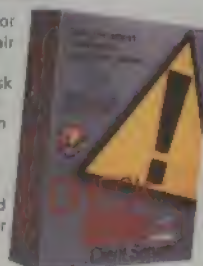
Only Check 2000 Client Server does all this and more...

- Performs a detailed hardware and software audit of your network
- Scans spreadsheets and databases for year 2000 problems, drilling down to individual cells
- Finds and Fixes critical (BIOS) problems on your network
- Collates network data into one common database
- Supplies a top-down view of your year 2000 readiness
- Provides detailed reports for all levels of your enterprise, from management to technical
- Prioritizes software and data

problems for timely repair

- Offers ongoing risk assessment to maintain your protection, as you change and add to your network.

The client server software will run on the following operating systems: DOS, Win 3.1x (including for workgroups), Win 95 and Win NT 4.0.



\$399

GRE005 Check 2000 Client Server

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Category Index

Accounts	10, 11
Business Development	13
Business	16, 17
CAD	24, 25
Communication	26, 27
Digital Cameras	40
Graphics Cards	42, 43
Graphics/DTP Software	18-23
Internet	40, 41
Microsoft	3, 8, 9
Modems	44, 45
Networking	47
Notebooks	4
OCR	34, 36
PCs	5
Printers	6, 7
Reference/Training	12
Scanners	35, 36, 37
Storage	37-39
Tape Backup	46
UPS	46
Utilities	26-31
Video Capture	40, 42, 43
Voice Recognition	14, 15, 17
Y2K	32, 33

OmniPage Pro v9.0 Upgrade

The World's Best OCR Just Got Better

OmniPage Pro 9.0, the latest version of the world's best-selling optical character recognition (OCR) software, lets you quickly and easily convert scanned pages into computer-editable documents, more accurately than ever before. Other new features include enhanced integration with Microsoft Word, and multithreading for faster processing.



OMN021
OmniPage Pro
9.0 U/G OEM

ONLY \$199
(oem) When purchased
with a scanner

Superior Integration

Superior integration with MS Word. Now you can perform all your OCR functions directly from Microsoft Word - and proof your results by comparing them to the original image. You can also share a dictionary with Word, so you never have to add a word twice.

Easy, One Button OCR

With just one click of a button, our AutoOCR Toolbar guides you through the entire OCR process. Or simply let our OCR Wizard do it for you. Nothing could be easier!

Colour

For the first time ever, OmniPage Pro lets you scan colour documents and save colour graphics into your word processor.

Maximum Zone Flexibility

New OmniPage Pro 9.0 identifies regions of text and graphics on a page to improve recognition and formatting. Let OmniPage Pro find them for you, and then you can add, delete, move, combine and split them any way you want.

Tables and Spreadsheets

OmniPage Pro 9.0 automatically detects tables within documents and preserves them as table objects in Word and WordPerfect. And now you can save spreadsheets directly to Excel, 1-2-3 or Quattro Pro with formatting just like the original.

Over 99% Accurate

OmniPage Pro 9.0 makes a quantum leap in OCR accuracy. Major improvements in our OCR technology mean you can accurately recognise a greater variety of documents, with far fewer errors:

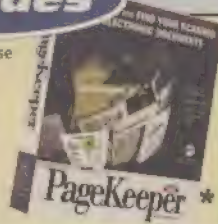
- * Letters, articles, reports, memos
- * Very small text and number
- * Even poor-quality copies and degraded faxes...



Includes

PageKeeper

OmniPage Pro 9.0 also comes with PageKeeper Standard - the easiest way to organise and find scanned and electronic documents. If you work with scanned pages, Microsoft Word files, Web pages or photos, PageKeeper is a must! Manage any type of document: PageKeeper organise scanned pages, Word files, photos, spreadsheets, brochures, Web pages, articles. Easy to organise and retrieve: Organise files any way you want. To retrieve, simply enter any keyword and PageKeeper will find all documents containing that word and give you thumbnails of those documents. Then click the document you want to work with.



* box shown for display purposes only

OMN020 OmniPage 9.0 U/G.....Upgrade from ANY OCR software.....

\$199



OmniForm 3.0

The Easy Way to Make Forms Electronic

Electronic forms by OmniForm have a lot of advantages over paper forms. And they're so easy to create! Just scan in a paper form, and seconds later there's the form on your computer screen, ready to be filled out, edited, stored, printed, e-mailed - whatever you want to do with it! Or, design a whole new form! OmniForm 3.0 is a low-cost, complete forms solution you can use immediately.

Key features:

- * Form Assistant guides you through the steps
- * Instantly generate fillable, editable forms
- * Tab and type to fill in your forms
- * Easily edit and modify forms

- * Fill forms quickly with Type Ahead
- * Check spelling and perform calculations
- * Automatically create a database
- * Print, fax, e-mail, and route forms easily
- * Open, edit, and fill forms in Microsoft Word



OMN014 OmniForm 3.0

\$299

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The easiest scanner for home

If you need an easy scanning solution, try the HP ScanJet 4100C. Everything you need for unmatched ease and convenience is right in the box, including software to scan, copy, make changes, store or print.

- Guided workflow for quick results.
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- 4100C Features**
 - Push button scanning
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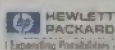
- Auto descreen/deskew
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- 36-bit colour image processor
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HP ScanJet 5200C

Highest productivity for business



- 600dpi optical, 9600dpi enhanced
- On-line e-mail and web task software
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All the features of the 4100C plus:

- Additional software - Adobe PhotoDeluxe Business Edition, valued at \$99
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HP ScanJet 6200C

Best image quality for professionals



- Increases productivity by up to 4 times over comparable scanners.
- Networkable scanner for high workgroup productivity
- Capable of unlimited enhanced resolution for quality image capturing
- USB/SCSI capable

All the features of the 5100C plus:

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- Intelligent Assistance
- Unlimited enhanced resolution
- Advanced imaging controls
- 35mm slide scanning

HP ScanJet 6250C

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- A powerful networkable scanner for high workgroup productivity
- Integrated automatic document feeder for multi-page scanning
- Increases productivity by up to 4 times over comparable scanners
- Capable of unlimited enhanced resolution for quality image capturing
- USB/SCSI capable

All the features of the 6200C plus:

- 25 page automatic document feeder (215mm x 356mm)

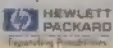
HPS026 HP ScanJet 5200C... **\$465**

HPS020 HP ScanJet 6200C... **\$745**

HPS021 HP ScanJet 6250C... **\$945**

HP OfficeJet Pro 1170C

Here's the perfect way to get the best performance for your office and professional needs. The OfficeJet Pro 1170C gives you all the capabilities of a full range of office equipment in one powerful business tool. You get a colour printer, colour scanner and colour copier. What's more, they're fast, easy and convenient to use - and extremely reliable.



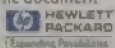
Features

- Printing speeds up to 9ppm black and 5ppm colour
- PhotoREt II photo-realistic printing for brilliant, vivid colours
- Prints on a variety of papers: letter, legal and A4 sizes: plain, transparency, photo, envelopes, labels, cards, and iron-on T-shirt transfers
- Caere OmniPage Limited Edition OCR software for scanning in text
- Built-in flatbed scanner lets you scan just about anything, as well as copy books, magazines and single pages
- Advanced copy features such as clone, poster, mirror, auto-enlarge and super zoom

HWP360 HP OfficeJet Pro 1170C... **\$1375**

HP OfficeJet Pro 1175C

All the features of the 1170C, plus PC-assisted faxing and a 30-page automatic document feeder!



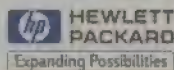
HWP362 HP OfficeJet Pro 1175C... **\$1765**



HP OfficeJet 635

Four in one system, Colour Printer, Fax Copier and Scanner

Completing your work in colour is now convenient and easy. The HP OfficeJet 635 prints, scans and copies in colour, making it simple to impress customers or clients. Plus, it's a plain paper fax. You get four essential office devices in one powerful package. The HP OfficeJet 635 can easily share the same telephone line as a phone and/or answering machine. The distinctive ring feature detects the appropriate incoming signal and automatically switches functions. After a one-time software installation onto a connected computer, you may use the fax functions either from the PC or the touchpad, and use the HP OfficeJet 635 as a standalone fax machine. Faxes can be sent and received even when the computer is turned off.



Features

- All-in-One - business-quality colour and B&W printing, plain paper and PC faxing, easy-to-use colour scanning including OCR, convenient versatile colour copying with reduce/enlarge.
- Print - Up to 5 ppm B&W and 2 ppm colour, versatile printing on plain paper (letter, legal and A4), transparencies, glossy paper, premium inkjet paper, envelopes, labels and card stock.
- Fax - 29 page automatic document feeder, up to 100 speed dial for fast faxing, and automatic photo/fax/answering machine switching.
- Scan - 256 levels of gray for near photo-quality images, TWAIN compatible for easy insertion of images into your software applications, Caere/E

OmniPage/E Limited Edition OCR software.

- Copy - Up to 99 copies from one original, reduce, enlarge or make full-size multiple colour copies, digital copying technology uses an image-processing chip to ensure the highest quality copies, makes B&W copies independent of the PC after setup (requires PC to be on for colour copies)

HWP213 HP OfficeJet 635

HP OfficeJet 710

Four in one system, Colour Printer, Fax Copier and Scanner - All in Colour!

In addition to the benefits of the HP OfficeJet 635, the HP OfficeJet 710 makes it even easier to impress your customers and clients. Not only does the HP OfficeJet 710 offer standalone black and white faxing, but it also features PC-assisted colour faxing and large multi-page memory!



HWP369 HP OfficeJet 710

\$965

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Stay organised, wherever you go! The 3COM Palm III is the latest version of the award winning range of personal organisers from 3COM. Weighing in at an amazing 126 grams (approx 160 grams including the batteries) and measuring 12cm by 8cm by 2cm, the Palm III can:

- Store 6000 addresses
- 5 years of appointments
- 1500 to do items
- 1500 memos
- 200 emails

It includes an address book, date book, to do list, memo pad, expense report templates, calculator, security options and some bonus games. Powerful enough to keep you organised. Small enough to fit in your pocket. The amazing Palm III from 3COM.

US\$651..... **\$629**



MICROTEK High-Tech SCANNERS

MICROTEK ScanMaker 4



The new MICROTEK ScanMaker 4 is 2 scanners in 1. It's both a professional quality flatbed scanner and a transparency scanner using Microtek's patented E.D.T. technology! Special film holders are used to scan slides & transparencies directly inside the scanner, thereby eliminating the loss of optical quality caused by glass. It also offers a robust design, fast and quiet operation, 36 bit colour and a professional scanning software with ColorSync colour management, and much more!

PRO528 Microtek ScanMaker4 **\$1679**

MICROTEK 35T Plus 35mm Slide Scanner

- High-speed, high-resolution Slide Scanner
- 3,900 x 1,950 DPI Optical
- 3,900 DPI Interpolated
- Scans both negatives and positives
- Scans strips or mounted slides
- Imaging Magazine Editor's choice



35mm slides are far more difficult to scan than standard photos. The 35T Plus is designed to scan purely 35mm slides, delivering not only the higher resolution required for slides, but also by eliminating the use of mirrors and glass, it delivers much sharper images.

PRO504 Microtek 35T Plus **\$999**

MICROTEK ScanMaker X6

The Microtek ScanMaker X6 offers a sharper image, much higher resolution, superior colour accuracy and much better shadow detail compared to entry level scanners. The benefits are clearly apparent when scanning line art (e.g. logos or line drawings), when you require enlargement of your original, when scanning transparencies or difficult colour photos. A better scanner also means you don't waste your time correcting every scan.

To make sure the X6 offers unbeatable value, an exceptional collection of quality software is offered. This includes Windows software for image editing, OCR (text recognition), document management, a program to create your own digital photo albums, a utility to SCAN to Print/Fax, a large library of backgrounds and stock photography and great software to automatically blend your pictures with calendars, greeting cards, etc...

For Windows users, a genuine Adaptec 1505AE SCSI card is supplied which lets you daisy chain other external SCSI devices (e.g. SCSI Zip drive, tape drive, CD writer, slide scanner).



Parallel Version Now Available

- Higher resolution than HP 6100C!
- 36 bit colour input and processing (1 pass)
- 1, 8, 12, 24 or 36 bit output
- 4 times the definition of entry level scanners
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- FlexScan lid
- Zero Reflection Design
- Advanced Image Enhancer
- Great bundled software
- Includes Adapter 1505AE SCSI
- Tri-linear CCD sensor array
- Dynamic range: 3.2
- 12 months warranty

PRO526 Microtek ScanMaker X6 Parallel **\$499**
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X Pagis Pro 2.0 4 Powerful Scanning Products In 1 Easy To Use Program!

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UMAX Flatbed Scanner only \$149

UMAX Astra 610 Series Scanner

The plug 'n' play flatbed scanner that adds colour and life to your documents!

Add the colour and vitality of images to everything you do on your computer with the Astra 610 series scanners from UMAX. After plugging the scanner in and installing the software, simply turn it on and you're ready to go - it's that easy! Designed especially with the home or small office user in mind, the Astra 610P or 610S are sleek, compact, affordable scanners that fit right there on your desktop.

The diverse range of user friendly software bundled with the Astra 610 makes right work of any task. Whether you are scanning your favourite photo to e-mail to friends or using OCR to scan text for an assignment, it can all be done at the push of a button with the easy to use UMAX Astra 610 series!

Features

- 600x300 dpi optical resolution for crisp, vibrant images
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- Single pass colour CCD for fast productivity
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- UMAX VistaScan
- Caere Omnipage OCR
- Presto! PhotoAlbum (Win only)
- Presto! PageManager



UMAX Astra 1220 Series Scanner

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- Your choice of SCSI, Parallel (PC) or USB connectivity
- Optional Transparency adaptor

Software

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- UMAX VistaScan
- Caere Omnipage OCR
- Presto! PhotoAlbum (Win only)
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Maxvision 85

15 inch EBT, 0.28mm dot pitch, Non glare, 1280 x 1024 @ 70Hz Max M



UMA016 **\$349**

Maxvision 87

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HP CD-Writer Plus 8100i

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Software Features:

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CD-Writer Plus lets you store, organize, share and distribute information like never before.

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PLUS all the software packages that were included with the 7100, such as:

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- 1 x Sony CD-RW disc
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- User guide

SONY45

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A blistering 24x read speed coupled with a 4x write once speed and 2x rewrite speed makes this the total CD/CD-R/CD-RW solution.



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4 genuine multicoloured 100MB Zip disks

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- colours help organise

RecordIt software

- for voice and music

IOM096 Zip Starter Kit (Parallel port)

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- Easy to connect - just plug it into your USB port, and you're ready to go
- Hot swappable - switch with other USB devices without turning off your computer
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For more information on which drive is right for you, contact our sales team on 1300 300 003

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IOM095 Zip Internal ATAPI

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*100MB capacity where 1MB=1million bytes. The capacity reported by your operating system may differ.



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IOM099 **\$45**



IAZ 1Gb Disk PC 3-PK

IOM032 **\$569**

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IOM097 **\$199**

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Category
Index

Accounts	10,11
Business Development	13
Business	16,17
CAD	24,25
Communication	26,27
Digital Cameras	40
Graphics Cards	42,43
Graphics/DTP Software	18-23
Internet	40,41
Microsoft	3,8,9
Modems	44,45
Networking	47
Notebooks	4
OCR	34,36
PCs	5
Printers	6,7
Reference/Training	12
Scanners	35,36,37
Storage	37-39
Tape Backup	46
UPS	46
Utilities	26-31
Video Capture	40,42,43
Voice Recognition	14,15,17
Y2K	32,33

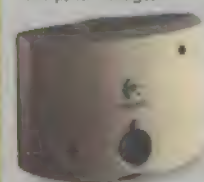
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Kodak ds
digital science™

Technical Information:

1160 x 872 pixels

Image resolution: 1152 x 864 pixels (high), 640 x 480 pixels (standard)

Colour: 24-bit, millions of colours

LCD Viewfinder: 1.8" TFT colour LCD for review and preview

Flash: Built-in (automatic, fill, red-eye, fill/red-eye, off)

Lens: Focus-free, 37mm threads accept optional lenses

• Self timer (10 sec)

• InfoLithium rechargeable battery and charger

SKOD024 Kodak DC200 Digital Camera

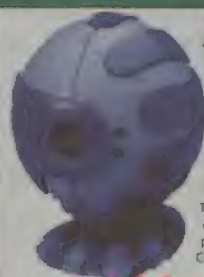
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Video Conferencing, Personal Surveillance/Receptionist & Message Recorder Combined, "Robo Snoop" will allow users the option to perform video conferencing, surveillance, video capture, receptionist duties & message recordings, all for a great price.

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CMP005 COMPRO PS39 Digital Video Camera.....

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This is your camera.



This is your film.



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**Shoot Still or Moving Images
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Shoot still or moving images (with voiceover) straight on a 3.5" disk and email it to friends and family anywhere in the World in minutes. With the Mavica MVC-FD81, users can record XGA resolution (1024x768) still images and up to one minute of MPEG moving images onto a standard 3.5" disk with no need for special capture boards, driver software or messy cables. This new digital camera takes technology to new levels.

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- 3x Optical Zoom lens (f5.2-15.6)
- Voice Memo mode (up to 10 sec)
- Self timer (10 sec)
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SONY25 Sony Mavica MVC-FD81 Camera

\$1949

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It's like having 200 application in one! KeyView Pro will allow you to instantly view and print:

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KIS042 KeyView Pro

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KIS044 Speed Surfer Internet Toolbox

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FREE communication to anywhere in the world!

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Features:

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- Internet Fax allows you to send Windows documents to any fax machine in the world and completely eliminate long distance charges
- Internet Answering

- Machine takes voice and video messages when you're out
- Spice up your emails with voice and video clips, and, because there's no special software required, you can send multimedia email to anyone
- Turn your video camera into a security camera that sends you a 30-second email clip when motion is detected



SM5001 Internet CommSuite

\$95

Simplecomputing NetExpress 56 - SVD Data Fax Voice Modem



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- First three Months Web Hosting included
- Detailed Administrators Manual
- N/A
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- Detailed Statistics
- Includes .com.au Domain Name Registration
- WebCentral Wizard Software
- First three Months Web Hosting included
- Detailed Administrators Manual
- Support for SQL and Access Databases
- Supports your own CGI and ASP Scripts



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\$280

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Australia's Largest Web Hosting Company

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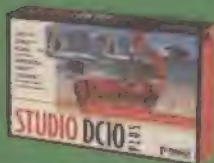
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PIN024 Studio DC10 Plus

\$679



**WaveWatcher
NET-TV 98**



Watch TV or Capture Video from any CamCorder, VCR or DVD.

Watch any of your favourite TV shows in a scalable, sizeable window on your PC, while you work on other projects! WaveWatcher Net-TV 98 is cable ready, and will accept input from VCR's when there is nothing worth watching on its 125 channels. It will even play DVD.

WaveWatcher Net-TV 98 is a full motion capture card with image editing software included for personalising your pictures.

Make the most of WaveWatcher Net-TV 98's video conferencing compatibility. You can use virtually any conferencing software to take full advantage of the Internet's communications features. WaveWatcher Net-TV 98 also comes with ULTRAO Media Studio Pro 2.5 V.E., which allows you to edit, morph and apply effects to your captured full-motion videos.



\$249

A55018 WaveWatcher NET-TV 98

**AI Gotcha 2
Portable Video Capture**

Take snapshots of your favourite images from Camcorder, VCR, or other Video source in 16.7 million colours into your PC. You can use photos for multimedia presentations, web page publishing, disk based catalogues, personal photo albums, image databases, digital greeting cards, newsletters, e-mails and much more. This is a simple plug-in (parallel port) and play device providing a high quality portable capture solution. By connecting to a video source, whether composite or Y/C, an extremely high quality image can be captured (1600 x 1200 dpi) into any of the supported graphic file formats.

Features

- AI Gotcha! Real-time image capture software
- Internet audio postcard
- Parallel port extension cable
- AI Gotcha! hardware (NTSC/PAL)
- Video Craft Multi-Media suite of special effects
- Pass through printer connections

* for a limited time only

A55011 AI Gotcha 2



\$145



Robo Snoo Bundle

Video Conferencing, Personal Surveillance/Receptionist & Message Recorder Combined, "Robo Snoo" will allow users the option to perform video conferencing, surveillance, video capture, receptionist duties & message recordings, all for a great price.

The RoboCam USB Camera delivers crystal clear pictures with the latest CMOS 300K technology.

PC Snoo integrates Stealth surveillance & Video Message Recording for Home & Office applications.



ONLY \$279
A55017

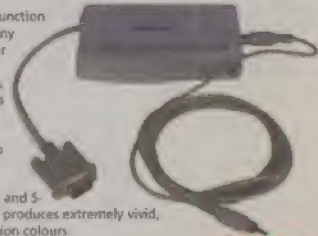
Pocket Scan Converter (PSC 1106)

Your business presentations on the big screen.

Using the Pocket Scan Converter in conjunction with your notebook computer (or PC), any presentation can be displayed on a TV or recorded onto video tape, making the Pocket Scan Converter ideal for business, education and training applications. This compact device simply plug into your notebook/PC and the other end into a TV/Video to put your presentations onto the big screen. And when the work is done, play computer games on your TV. Designed with flicker reduction circuitry and S-VHS support, the Pocket Scan Converter produces extremely vivid, high quality images with up to 16.8 million colours.

* for a limited time only

A55001 PSC 1106



\$169

Accelerate your world with Diamond

Monster Fusion

Voodoo 3D Gaming & Blistering 2D Speed!

Diamond's new Monster Fusion takes edge-of-your-seat Voodoo 3D gaming performance and fuses it with high-speed 2D acceleration - all on a single card. Based on ground breaking 3Dfx technology, Monster Fusion brings you outrageous 60 frames per second game play, state-of-the-art 3D features, and complete game support based on the most popular APIs. Your 2D presentation and Web graphics will fly on the screen in vivid color at resolutions up to 1900x1200.



Key Features:

- 3DfxTM Voodoo BansheeTM technology
- Fully integrated 3D and 2D graphics with 16MB memory
- True 128-bit Windows acceleration
- Outrageous 3D gaming performance at 60 fps
- Awesome game support: Glide, Direct3D and MiniGL
- Available in PCI and AGP models

DIA035 Diamond Monster Fusion AGP

\$299

DIA036 Diamond Monster Fusion PCI

\$299

All prices INCLUDE sales tax. Prices subject to change, see page 40 for terms & conditions.

Viper V550

Unprecedented 128-bit Power for 2D, 3D and Video!

Viper V550 from Diamond features unprecedented 128-bit power for state-of-the-art 2D business graphics and stunning 3D quality with high-speed game play. Based on the revolutionary NVIDIA RIVA TNTM chipset, and fully optimized for Windows 98, the Viper V550 represents the next generation in high performance graphics acceleration. Viper offers extensive multimedia features, and full support for Direct3D and OpenGL.



Key Features:

- Twin Texel engine with true single-pass multitexturing for exquisite 3D rendering
- Revolutionary 3D quality and performance for gaming and business applications
- State-of-the-art 2D acceleration with 16MB RAM and 250MHz DAC for true colour support up to 1920x1200
- Display graphics and video on your TV (retail version only)
- Available in PCI and AGP 2X
- Exciting software bundle including games and business software

DIA046 Diamond Viper V550 PCI

\$349

DIA048 Diamond Viper V550 AGP

\$349

Rio PMP300

Internet Music in the Palm of Your Hand!

Diamond's Rio PMP300 is the first portable MP3 music player that stores up to 60

minutes of digital-quality sound. It's smaller than an audio cassette and has no moving parts, so it never skips. Powered by a single AA battery, Rio provides up to 12 hours of continuous music playback.

Goodnoise, the premier source on the net for high-quality, downloadable music, is located at www.goodnoise.com.



Key Features:

- Palm size for easy portability
- Supports MP3 compression
- 32MB built-in flash memory
- Expandable playback time with removable flash cards
- Skip free - no moving parts
- MusicMatch Jukebox Limited Edition software for converting CD's to an MP3 format
- CD Music Sampler

DIA047 Diamond Rio PMP300

\$449

FIND IT CHEAPER? CALL US - WE WON'T BE BEATEN!*

Professionally Edit Your Home Videos Quickly & Easily with **STUDIO 400**

No need to take your PC apart. No need for an enormous hard drive. Just plug the Studio 400 in and start editing your movies! With Studio 400 you can:

- Change the sequence of your camcorder footage.
- Edit out unwanted footage quickly and accurately.
- Put titles and music to your video. You can even provide your own narration!
- Output to full resolution video tapes for distribution to clients, or simply to send to family and friends as a gift.
- Output to digital video. You can send movie clips (in the form of AVI files) to clients, friends or family via email. Plus you can include the clips in business presentations and on web pages.

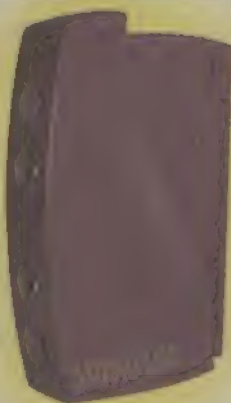
- Act like a professional! With over 160 professional quality scene transitions, from wipes and fades to cool dissolves, people will wonder how you got so good at editing!

Studio 400 is the only video editor that uses minimal hard disk space whilst editing. For a 1 hour full quality tape only 150Mb is used, compared with 4000-8000Mb with some other products. And if you don't think it's the quickest and easiest video editor you've ever seen, Hot Key will give you your money back*!

As seen on Australia's Funniest Home Video Show

Studio 400 can run on any Pentium-based PC with Windows 95 and 16 MB RAM, 30 MB free hard disk space, a free serial (COM) port, camcorder with LANC or Panasonic 5 Pin Jack and remote control VCR. You need only 150 MB free disk space to create a one hour, full quality video tape.

*Within 60 days from date of purchase. Fulfilled directly through Hot Key. Terms and conditions apply.



Stock Code: NIT013

\$699

Hauppauge!

Bring TV To Your PC With WinTV!

WinTV-Primio, WinTV-PCI and WinTV-Radio PCI Boards give you live video-in-a-window!

Hauppauge's WinTV Boards are single slot PCI cards with 125-channel TV tuners. The TV source can be from aerial or cable set top box TV. With the external audio/video inputs, you can also connect to a satellite receiver or VCR, camcorder or video camera. The WinTV Boards also extract Teletext data from the TV signal, and include VTRplus, the Professional Teletext software. These PCI Boards connect to your cable TV or to a TV antenna, and display live TV in a resizable window. They do this by digitizing the live video (from either the built-in 125-channel cable TV tuner or the external video input source) using high quality 4:2:2 video sampling. The digitized video is sent over the PCI bus into the memory of a VGA display adapter, a technique which makes the WinTV PCI boards easy to install and gives a great looking TV picture!

The WinTV-Primio, WinTV-PCI and WinTV-Radio support intercast data reception and Teletext data reception. Included is our VTRplus software, for multiple teletext page display and DDE (dynamic data exchange). While live video is being displayed, these boards can also extract either intercast data (Channel 7 in Sydney and Melbourne) or teletext data from the TV signal.



The WinTV PCI boards have these great features:

- Live TV in-a-window on VGA monitors from 640 x 480 to 1600 x 1200 pixels in up to 16 million colors, unique to WinTV.
- Built-in cable ready TV tuner: a 125-channel TV tuner with automatic channel scan.
- Resize the WinTV window from icon size to full screen (or any size in between!).
- Auxiliary audio/video input connects to video cameras, VCR's and camcorders.
- Audio output can go to your sound card's Line-In connector or to self-powered speakers.
- Capture professional quality 24-bit images with 4:2:2 digitizing.

image save formats supported: TIFF, BMP, PCX, GIF, TGA plus compressed JPEG in color or black/white at 8, 16 and 24 bits.

- Videoconference over the Internet! The WinTV PCI's video digitizer is compatible with your favorite conferencing package such as: Microsoft NetMeeting, CU-SeeMe, Smith Micro's AudioVision, VDOnet, Connectix VideoPhone, Vocaltec's Phone. Vivo and lots more. Simply add a video camera and one of these software packages to video conference over the phone lines or the Internet.
- Create high impact presentations with 320x240 AVI clip capture with real time preview. Creates high quality AVI video's in a YUV format.

HAU001 WinTV-Primio (with PAL B/G tuner and teletext)

HAU002 WinTV-PCI (with PAL B/G tuner, teletext decoder, intercast, full stereo sound)

HAU003 WinTV-Radio (with PAL B/G tuner, teletext, FM Radio, intercast)

\$199
\$269
\$349

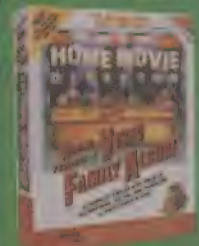
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Orderline 1300 300 003 or 02 9700 8800 Order by fax 02 9700 8801

Enquiries 02 9700 8800 Internet site www.iswh.com.au

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\$69.95

NIT020

For professional video editing, take a look at the Studio 400 on p43

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We have a new website address:

www.iswh.com.au

If you have visited our website before, we invite you to take another look. You will find it has changed quite dramatically. More information, more products and more importantly, more great deals! Thousands of products, all at the best prices. Whether you are looking for information, or want to place an order, make sure you pay us a visit first!

NetComm Roadster II 56 Ultra SVD Voice, Fax, Data Modem

Using the latest telephone exchange technology, the NetComm Roadster II 56 Ultra delivers much greater speed. So now the World Wide Web is made much more exciting - with super fast downloading of graphics, games and multimedia.

With Simultaneous Voice and Data (SVD) functionality, you can speak to the person you are sending data to at the same time on the same line. This is great for conferencing and saves you time and money.

The Roadster II 56 Ultra's multipurpose speakerphone capability turns your PC into a hands free telephone (Speakerphone). Your computer can

store all your phone numbers and dial with the click of a mouse button.

On the NetComm Communication CD you will find all you need to make the most of your modem including user guide, communication software, drivers, cool games and much more.



Headset Included

STOCK CODE: NET136

\$259



Includes WinFax Pro

NET144 NetComm Flexcard PCMCIA 56K Modem

\$319

NET021 NetComm CardModem 33.6K

\$255

NetComm Roadster II 56 USB The Ultra Fast Voice, Fax, Data, Modem

The Roadster II 56 USB incorporates the latest serial bus technology known as USB (Universal Serial Bus). USB is an evolutionary step up from current serial ports, offering higher throughput, TRUE Plug & Play and Auto Setup. It also does away with the need to use an external power supply, as the USB port of the computer now supplies the power to the modem directly.

USB Advantages

- No requirement for a bulky power pack and a free AC mains socket.
- One cable carries power and data, meaning less clutter on your desktop.
- Hot plugging, TRUE Plug & Play, just plug your Roadster into your PC and off you go. There is no requirement for you to even reboot your PC.
- Faster interface - USB as an interface is 10 times faster than parallel ports, 100 times faster than a standard RS 232 serial port. This means that a USB modem interfaces more efficiently than a standard serial connected modem.

SVD - Simultaneous Voice & Data

With the Roadster II 56 USB's Simultaneous Voice and Data (SVD) functionality, you can speak to the person you are sending data to at the same time, over the same telephone line, without having to make an additional call. While playing your favourite games, speak to and hear your competitors' reaction as you blast them away!

Included:

- Roadster II 56 USB modem
- USB cable
- Telephone line cord
- Warranty card and NetComm CD with Symantec WinFax Pro 8 (OEM version)
- Modem drivers and manuals. Drivers included for Windows 95/98 and many third party applications.



\$265

NET028 NetComm Roadster II 56 USB

Note: 56Kbps is a download speed only. 33.6 Kbps is the maximum upload speed. Download speed are subject of telecommunication carrier service

Banksia WaveSP 56 The fully featured 56,000bps modem!

The Wave SP is the first modem to be awarded a prestigious Australian Design Mark in recognition of design excellence and innovation.

The assessment panel commented that "(the Wave SP) is radically different from its competitors and upholds the highest principles of unitary design".

- Banksia's revolutionary new wave SP Fax Modem includes:
- High speed data transmission at 56,000bps (v.90 standard)
 - Microsoft Internet Explorer™ for Internet surfing & Web site construction
 - Fax transmission at 14,400bps
 - Simultaneous voice & data

- (SVD) transmission
- Full duplex speakerphone (hands free telephone)
- Fully featured smart answerphone
- The best new games
- A radical new shape for optimum audio performance

Buy a Banksia Wave SP 56 modem & get FREE 35mm camera (value \$29)!

5 YEAR WARRANTY



STOCK CODE: BAN100

\$225



Banksia

AUZ134 Banksia Wave 33.6 SP Fax Modem

\$199

BAN056 Banksia PC Card 56K

\$259

BAN060 Banksia Combo Card 56K + 10BASE T Ethernet Adaptor

\$339

All prices INCLUDE sales tax. Prices subject to change, see page 48 for terms & conditions.

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For the cost of a local call

Orderline 1300 300 003 or 02 9700 8800

Sales Lines Open 9am 'til 6pm Monday to Friday and 10am 'til 3pm Saturday



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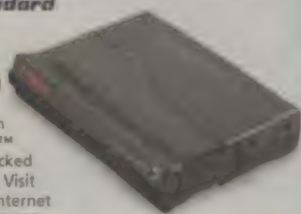


More connected.

3COM U.S. Robotics 56K* Voice Faxmodem

Includes V.90 ITU 56K standard and x2 technology

Experience the Internet like never before! Grab graphics-rich Web pages, e-mail, huge data files, real-time sound and video faster, play intense games, get more done online. Compatible with both the V.90 ITU 56K standard and x2™ technology. Includes a CD-ROM jam-packed with great software for work and play. Visit www.3com.com/56k for a compatible Internet provider near you or call us on 1300 300 003.



Key Benefits:

- Number 1 selling modem in the world
- Brings you great Web sites faster
- Software upgradeable for future enhancements

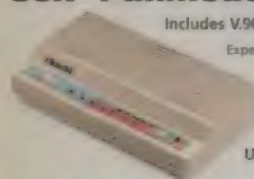
Stock Code:USR104

\$225

3COM U.S. Robotics 56K* Faxmodem

Includes V.90 ITU 56K standard and x2™ technology

Experience the Internet like never before! Grab Web pages, e-mail, data files, multimedia and games faster, get more done online! Compatible with V.90 standard and x2™ technology.



USR101 56K Faxmodem **\$179**

*Can receive at up to 56 Kbps, send at up to 31.2 Kbps. Due to FCC regulations, receiving speeds limited to 53 Kbps. Actual speeds may vary. Requires compatible phone line and server equipment.

Netcomm CardModem56



Now you can connect to the world even faster with the NetComm CardModem56. The CardModem56 is the ideal modem if you demand the ultimate in speed and portability. You can send and receive faxes at speeds of up to 14,400bps, while data download speeds of up to a scorching 56,000bps are supported (this depends on your telecommunication carrier service).

Features:

- Supports K56flex Technology
- PC Card Data / Fax Modem
- Error Correction and data compression, Distinctive Ring
- Maximum speed of 56,000bps (download only), 33,600bps, V.34,

- V.32bis, V.42bis, V.42, MNP2-4, MNP 5, MNP10EC, Plug 'n Play
- Maximum throughput 230,400bps
- Flash Rom upgradeable to V.90 and any other future enhancements via the website - <http://www.netcomm.com.au>

NET030 Netcomm CardModem56 **\$319**

Netcomm CardModem56 Combo

The Netcomm CardModem56 Combo comprises the Netcomm CardModem56 and Netcomm 10/100 PC Card and is the ideal modem if you demand the ultimate in speed and portability. Data download speeds of up to a scorching 56,000bps are supported (this depends on your telecommunications carrier service). For the mobile professional, the CardModem56 Combo also allows you to connect to an Ethernet LAN. So now you can connect to your office and the world with a single modem.

Features:

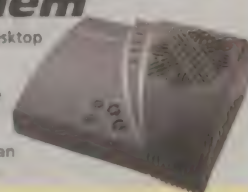
- Supports K56flex Technology
- PC Card Data / Fax Modem and Ethernet adapter
- Error Correction and data compression, Distinctive Ring
- Maximum throughput 230,400bps

- Supports Ethernet LAN connection via 10baseT/2
- Flash Rom upgradeable to V.90 and any other future enhancements via the website - <http://www.netcomm.com.au>

NET031 Netcomm CardModem56 Combo **\$569**

3Com U.S. Robotics 56K External Professional Message Modem

3Com's new range of 56Kbps V.90 standard desktop modems - the 3Com U.S. Robotics 56K V.90 External Professional Message Modem and 3Com U.S. Robotics 56K V.90 External Message Modem - enable users to meet all of their data, voice and message management needs with a single product, guaranteed to provide an enhanced and productive Internet experience.



Features:

- Faster Internet access
- Caller ID
- One-button access to voice messages
- Remote retrieval of voice messages through a dial-up connection
- Built-in high quality speakerphone
- V.80 (video conferencing) capable
- Easier installation and use
- Software upgradeable for future enhancements
- Backed by a Lifetime Limited Warranty
- Valued-added Connections CD-ROM Software

USR105 56K External Professional Message Modem **\$299**

3Com U.S. Robotics 56K External Message Modem

Features:

- Faster Internet access
- Remote retrieval of voice messages through a dial-up connection
- Software upgradeable for future enhancements
- Backed by a Lifetime Limited Warranty
- Valued-added Connections CD-ROM Software
- Easier installation and use

USR106 56K External Message Modem **\$269**

3Com Megahertz Global 56K

3Com Megahertz PC Cards give you the freedom to work when and wherever you need. Just slide one into your notebook and work from almost anywhere - in the office, on the road or in a plane. Connect locally, remotely, or both at the same time with a LAN+modem PC Card. Or get remote connections from wherever you roam with a modem PC Card. They're easy to use, configure, support, and update and guaranteed compatible with your notebook and your network. And because they're 3Com Megahertz PC Cards, you're assured of interoperability.



Try an easily installed, easily configured 3Com Megahertz LAN+56K Modem PC Card and get:

- Reliable, hassle-free, standards-based access and high-speed downloads anytime, anywhere.
- Simultaneous LAN and modem access with Parallel Tasking technology for LAN throughput up to 46 percent faster than PC Cards without it.
- Access anywhere with Direct-Connect Cellular capability.

If you're only after remote connections, try an easy to install 3Com Megahertz 56K Modem PC Card and get:

- Reliable, hassle-free, standards-based access and high-speed downloads anytime, anywhere from any model.
- Direct-Connect Cellular capability and advanced telephony features with cellular-capable models.
- A passport for worldwide access with a global model.
- Faster access working only in Windows, with an exclusively for Windows model.

USR100 3Com Megahertz Global 56K **\$309**

USR107 3Com Megahertz 56K Lan Modem **\$419**

3COM PALM III



Stay organised, wherever you go! The 3COM Palm III is the latest version of the award winning range of personal organisers from 3COM. Weighing in at an amazing 126 grams (approx 160 grams including the batteries) and measuring 12cm by 8cm by 2cm, the Palm III can:

- Store 6000 addresses
- 5 years of appointments
- 1500 to do items
- 1500 memos
- 200 emails

It includes an address book, date book, to do list, memo pad, expense report templates, calculator, security options and some bonus games. Powerful enough to keep you organised. Small enough to fit in your pocket. The amazing Palm III from 3COM.

USR051 **\$629**

Tamzin



All prices INCLUDE sales tax. Prices subject to change, see page 48 for terms & conditions.

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**Category
Index**

Accounts	10,11
Business Development	13
Business	16,17
CAD	24,25
Communication	26,27
Digital Cameras	40
Graphics Cards	42,43
Graphics/DTP Software	18-23
Internet	40,41
Microsoft	3,8,9
Modems	44,45
Networking	47
Notebooks	4
OCR	34,36
PCs	5
Printers	6,7
Reference/ Training	12
Scanners	35,36,37
Storage	37-39
Tape Backup	46
UPS	46
Utilities	26-31
Video Capture	40,42,43
Voice Recognition	14,15,17
Y2K	32,33



The Best Value in PC Power Protection

Back-UPS Best value power protection for stand alone PCs.

Features

- Compact design for desktop computers
- Surge protected outlet for laser printers
- Three battery back-up outlets to protect your work
- Lightning and surge suppression to protect your hardware
- Full-time EMI/RFI filters for noise filtration
- Communication interface port
- QuickSwap battery replacement system and Quick recharge
- User adjustable option switches allow you to save battery power
- Two year warranty and Industry approvals

**Save \$5 on
Back-UPS &
Back-UPS Pro**

APC013 APC Back-UPS 300	\$169
APC021 APC Back-UPS 500	\$209
APC022 APC Back-UPS 650	\$329

Back-UPS Pro

Performance power protection for advanced workstations.

Features

- Instantaneous Backup Power beats blackouts and brownouts
- Lightning and Surge Protection offer maximum hardware protection
- Network-grade Line Conditioning prevents glitches
- Compact Design for efficient use of your workspace
- User Replaceable, Hot-Swappable Batteries lower service costs and increase life span
- Communications Interface automatically preserves data integrity
- 10Base-T network cable surge suppression
- Advanced Warning Diagnostics prevent downtime
- Two year warranty and Industry approvals



APC001 APC Back-UPS Pro 280 PNP	\$309
APC002 APC Back-UPS Pro 420 PNP	\$449
APC003 APC Back-UPS Pro 650 PNP	\$575

Smart-UPS 420 & 620

Performance Power Management for advanced business networks

Features

- Instantaneous Backup Power beats blackouts and brownouts.
- Full-time Surge Suppression and Noise Isolation.
- CellGuard, Intelligent Battery Management.
- Advanced Warning Diagnostics & User replaceable, hot swappable batteries.
- SmartBoost and SmartTrim provide true brownout and overvoltage correction.
- Full C-Tick, UL and CSA approvals and 2 year warranty.

**Includes
FREE
powerchute
plus**



APC025 APC Smart-UPS 420	\$529
APC026 APC Smart-UPS 620	\$699
Also Available:	
APC005 APC Smart-UPS 700	\$949
APC006 APC Smart-UPS 1000	\$1279

Seagate Tape Backup Units



TRAVAN 4 - 8Gb

Features hardware compression and read while write. Backs up to 60Mb per minute*. The unit installs easily, and comes with a 2 year guarantee. The kit also includes Seagate Backup Exec and a free bonus tape to get you started.

SEA140 Internal IDE Kit	\$549
SEA141 Internal SCSI Kit	\$649
SEA142 External SCSI Kit	\$975
SEA155 5 pack of Travan tapes	\$259



DAT 12 - 24Gb

Ideal for network backup. This SCSI interface drive features proven technology for premium capacity and performance. Backs up at a rate of 2.2Mb per second*. Comes with a three year warranty.

SEA145 Internal SCSI Kit	\$2675
SEA178 External SCSI Kit	\$3025



AIT 25 - 50Gb

This Advanced Intelligent Tape unit backs up at the rate of 6Mb per second*. Featuring advanced metal evaporated tape (AME) memory in the cassette, this drive gives significantly faster loading and access times. And the self cleaning mechanism ensures high reliability.

SEA146 Internal Fast Wide SCSI Drive	\$4895
SEA147 External Fast Wide SCSI Drive	\$5570
SEA153 50Gb AIT tape	\$189

**SEAGATE BACKUP
SOFTWARE
Workstation**

Seagate Backup Exec v3	
SEA109	\$125
Seagate Backup Exec v3	
Upgrade SEA156	\$48

NT Server

Seagate Backup v7.2 NT	
Single Server	
SEA101	\$949
Seagate Backup v7.2 NT	
Single Server Upgrade	
SEA175	\$519
Seagate Backup v7.2 NT	
Multi Server	
SEA041	\$1765

Call for latest pricing on Seagate Backup for S85 and Novell Netware

All prices INCLUDE sales tax. Prices subject to change, see page 48 for terms & conditions.



FIND IT CHEAPER? CALL US - WE WON'T BE BEATEN!*

D-Link Integrated Networking

In today's communication, networking means connecting people together at work, at home and on the move, creating a world of information at every one's fingertip and affordable to every one.

D-Link, a leader in workgroups' communication, provides integrated solutions that guide you on the fast track to the most economical and dependable way of networking. Products range from intuitive adapters for desktop connectivity, to handy network cards for mobile users and high-speed devices for seamless internetworking. Coupled with a global presence, D-Link is committed not only to providing powerful networking tools but also to customer satisfaction with on-target consultation and service throughout five continents.

Ethernet Interface Adapter

DFE-530TX

PCI-bus 10/100M Fast Ethernet Network Interface Card

- Intelligent Ethernet/Fast Ethernet Adapter, Auto negotiating 10Base-T/100Base-TX (Nway)
- Plug and Play support. Low CPU utilisation. 32 Bit high performance.
- Optional remote boot rom. Certified driver for Netware, SCO Unix, Windows 95 and Windows NT.



\$55

DLK004 DFE-530TX 10/100 PCI Network Card

Internet Server

DP-602

2 port Internet ready Server for SOHO Networks

- 1 x 10/100Mbps NWay Ethernet Port, 2 x RS-232 460Kbs Com Ports.
- Supports NAT for single ISP user account, Dial-on-Demand, DHCP, PPP, PAP/CHAP Security
- Dual use of Com ports for double bandwidth. Support for Analog modem or BRI ISDN TA.
- Admin through Windows based program, Web browser and telnet.



\$475

DLK006 DP-602 Internet Server

10/100Mbps NWay Dual Speed Hubs

DFE-908X/N

8-port 10/100Mbps Dual Speed Hub with Switching. Stackable

- Unmanaged 8 port Nway Dual Speed Hub. Stackable up to 5 units or 40 ports.
- 8 x RJ45 ports to support CAT3,4,5 for 10Mbit connection, CAT5 for 100Mbit connection.
- Internal switch module to connect 10 and 100Mbit backplanes.



\$679

DLK011 DFE-908X/N 8-port 10/100Mbps Hub

DFE-916X/N

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Win 3.x, OS/2, Mac, Linux

Simply launch your favourite browser and load the file DEFAULT.HTM in the root directory of the CD.

If you don't have a browser, run the file INSTALL.BAT in the root directory of the CD.

The CDs have been tested using Netscape Navigator 3.0 and 4.0, and MS Internet Explorer 3.0 and 4.0.

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Connection is key in this month's selection of new IT titles.

In the palm of your hand

PalmPilot: The Ultimate Guide

This book distinguishes itself as a useful resource for all Palm OS users, but disappoints in its tendency to be longwinded. More than 100 pages are devoted to an explanation of the hardware and basic software included with the PalmPilot and the Palm III. Most of these pages do little more than rehash the manual while providing a few useful tips along the way. A new user could make better use of their time by actually playing with the device, rather than reading the waffle.

The rest of the book, however, is an excellent resource, although at times it seems a little incomplete. It is astounding that despite a very detailed chapter explaining how to use email with a PalmPilot — complete with methods for using it with AOL, Netscape Mail and Outlook Express — there is not a whisper about the lifeblood of so many corporate users, Lotus Notes.

The section on 'The Undiscovered Pilot' is a definite space-filler, using good paper to claim the device is capable of making squeaking noises and looking at greyscale images. But there are more than 20 pages dedicated to programming for the Palm Pilot, and a version of Metrowerks CodeWarrior for PalmPilot is included on the CD.

The CD itself is an excellent source of software and works from both Mac and Windows clients. It is only a bundled product, rather than an integrated one, so don't expect to find troubleshooting tips or searchable indexes on the CD — just 900 functioning programs for PalmOS, including a number of specialist packages for aviation and medical purposes.

The true use of this book becomes apparent around page 300, where online-specific information is discussed. It includes some of the best information available on using, troubleshooting and upgrading PalmPilots and Palm III systems.

Ari Weisz-Koves



■ Author	David Pogue
■ Publisher	O'Reilly & Associates
■ Distributor	Woodslane
■ Phone	(02) 9970 5111
■ Price	\$69.95
■ ISBN	1-56592-420-7
■ Rating	★★★

Better, Faster Email

There's no doubt that email has transformed many workplaces. While the oft-quoted idea of a 'paperless office' has yet to materialise, the efficient use of email can transform offices, and not just through the speed of its delivery. Joan Tunstall's *Better, Faster Email* is a guide to email that goes beyond the idea of just sending messages.

The book is noteworthy for its broad scope, but this is also unfortunately its largest weakness. Because it doesn't deal with any one specific package (instead opting to view email from a more general viewpoint), it can only give general ideas

as to what can be done with email packages. The end effect? While you may like some of the ideas presented there's no guarantee that your email package supports them, and no advice on how to activate them if it does. Instead, common approaches to everyday tasks are mentioned, but the overall value of these is suspect beyond simply introducing their existence. There's little point in detailed but vague instructions.

Guide to ratings

★	Mike Atherton: No runs on the board
★★	Graeme Hick: Doesn't realise potential
★★★	Shane Warne: Needs to trim the fat
★★★★	Stuart MacGill: Heading for the top
★★★★★	Steve Waugh: A true legend

Better, Faster Email shines in its overview of the effects of email. It considers email alongside other forms of office communication; phone, fax and face-to-face communication. The implications of email are investigated, and for anyone who ever viewed email as just another communication medium, this chapter is an eye-opening read.

The overall tone of the book is fairly simple, jargon-demystification being the main aim. If that's what you're after, then *Better, Faster Email* could be for you.

Alex Kidman

■ Author	Joan Tunstall
■ Publisher	Allen & Unwin
■ Distributor	Allen & Unwin
■ Phone	(02) 8425 0100
■ Price	\$14.95
■ ISBN	1-86448-899-9
■ Rating	★★★

Hosting Web Communities

What an interesting book! The second paragraph begins "I spent the early 1970s learning from a Zen cowboy", and it quickly becomes apparent that the author is a veteran of the Haight Ashbury/Grateful Deadhead online community made famous by the WELL (Whole Earth 'Lectronic Link). In fact, Cliff Figallo spent six years as director of the WELL, online home of visionaries like Howard Rheingold and John Perry Barlow.

Yet the cover of the book proclaims it's about "building relationships, increasing customer loyalty, and maintaining a competitive edge"—not very hippie-sounding. Has Figallo finally sold out to his über-capitalist backer, Mecklermedia? Maybe. But whatever the cover may proclaim, the author's alternative roots are

his inspiration — by tapping into the unstoppable commercial desire to create the ultimate Web attraction and actually make a profit from it, Figallo gets to perpetuate his vision of virtual communities where people *really* connect.

He quickly pays tribute to two previous books about cyberspace — Rheingold's *The Virtual Community* (published in 1993) and *Net Gain* by John Hagel and Arthur Armstrong (1997). Where Rheingold defined online community, Hagel and Armstrong presented it as a necessary part of Web-based business. Figallo's book is more of a 'how-to' manual — a highly specialised publication (hence its price) for those who can actually afford to invest the time and money required to maintain a true online community. Anyone starting a Web site that will fill a niche and attract dedicated followers will also find the advice useful, but Figallo's experiences are larger in scale. He genuinely is a leader in the field, and also happens to be a thorough, entertaining writer.

Simon Vandore

■ Author	Cliff Figallo
■ Publisher	Wiley Computer Publishing
■ Distributor	Jacaranda Wiley
■ Phone	(02) 9805 1100
■ Price	\$65
■ ISBN	0-471-28293-6
■ Rating	★★★★

Red Hat Linux Secrets

The Linux operating system is an immensely powerful tool, featuring thousands of applications which can perform practically any computing task. Unfortunately, Linux is also a complex beast, and mastering the ins and outs of the operating system can take a great

deal of time and patience. If you've found that you're running into difficulties learning the operating system from the supplied manual, you may just want to have a look at *Red Hat Linux Secrets* (Second Edition).

It contains *lots* of information. Nearly every Linux-related topic is covered. Disappointingly, however, the book seems to spend a lot of time on not so important topics, while skimming over some of the more important ones. Further, many of the topics that receive coverage are not at all well suited to a book on Linux. For example, the section on shell-scripting receives little attention, while the modem coverage in the hardware section even goes so far as to explain the concept of the little-used even/odd parity error handling. Likewise, the seven-layer model of networking is interesting, but it probably isn't best suited for a book on using Linux.

Another drawback to *Red Hat Linux Secrets* is that the ordering often seems illogical. For example, one of the most basic tasks in any operating system — and especially Linux — is editing text files. However, this topic is covered only in the last chapter of the book.

Despite these quibbles, there is a wealth of information to be found in this title and many of the topics are covered in greater detail than in other Linux reference books.

Travis Simon

■ Author	Naba Barkakati
■ Publisher	IDG Books Worldwide
■ Distributor	Woodslane
■ Phone	(02) 9970 5111
■ Price	\$110
■ ISBN	0-7645-3175-1
■ Rating	★★★☆

Off the Shelf

Title	Author	Publisher	Distributor	Phone	Price	ISBN
Sams Teach Yourself PalmPilot and Palm III in 10 Minutes	Preston Gralla	Sams	Prentice Hall	(02) 9454 2200	\$24.95	0-6723-1452-5
Teach Yourself CC:Mail 8.2 in 10 Minutes	Jane Calabria	MacMillan	Prentice Hall	(02) 9454 2200	\$24.95	0-6723-1420-7
Harley Hahn's Internet & Web Golden Directory 1999	Harley Hahn	Osborne/ McGraw-Hill	McGraw-Hill	(02) 9417 4288	\$59.95	0-0721-1893-8
ISP Survival Guide	Geoff Huston	Wiley US	Jacaranda Wiley	(02) 9805 1100	\$95	0-4712-1499-4
Year 2000 Software Testing	William Perry	Wiley US	Jacaranda Wiley	(02) 9805 1100	\$105	0-4713-1428-5
Choosing a Database for your Website	John Ashenfelter	Wiley US	Jacaranda Wiley	(02) 9805 1100	\$39.95	0-4712-9690-2
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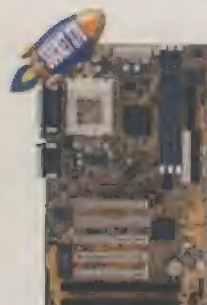
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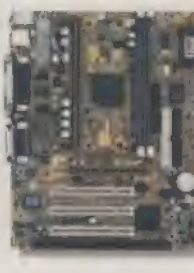
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Perspective: The final frontier?

How the Web was Won

Everyone's familiar with the concertinaed idea of technological evolution dubbed 'Internet time'. In Internet time, everything, including technology itself, content, the way the infrastructure is exploited, and the time people are willing to devote to a particular experience, is shortened and accelerated.

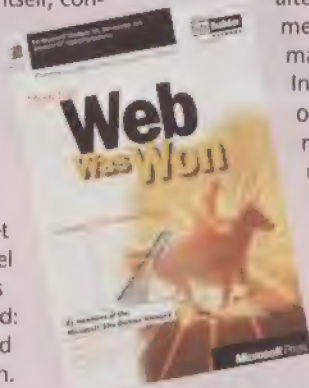
Despite all this acceleration and change, the Internet itself, meaning the basic-level protocols and pipes, remains relatively static. It's like a road: once it's built, it doesn't need to change form all that much. What does change are the cars, buses and trucks that drive over it.

Books on the Internet are often a dubious proposition because 'Internet time' should, in theory, make them outdated as soon as they hit the shelves. But some experiences and anecdotes, like the protocols underlying the Internet, remain relatively unchanged.

How the Web was Won brings together the experiences of several people who have managed to stake their claim on what's still a relatively underdeveloped frontier. Their experiences coming to grips with the concept of the Internet (in the early days) and then trying to figure out how a business could be successful in the online environment should be useful to all those that want a piece of Internet gold, regardless of how the technology changes over time.

Each chapter is devoted to a different pioneer. They are written in the first person, using a snappy, easily digestible style. The value of each anecdote is enhanced by the lack of techno-evangelism in the book. This is surprising, considering that the authors were drawn from companies holding 'tier 3' membership in Microsoft's Site Builder Network techno-evangelism club, and considering Microsoft Press is the publisher.

Although the book is ostensibly aimed at online-business builders, it contains enough value to appeal to a student of Internet history or a business studies aficionado, especially the section titled 'Why the Web is not Television'. Here the author, a multimedia developer named Bryan McCormack, emphasises the unidirectional, passive nature of TV.



Television, he says, is "essentially an advertising appliance". In his opinion the Web can never rival TV's "shared moments" because it offers too many alternatives, too many fragmented experiences and too many options for consumers of Internet content. He then goes on to detail failed attempts to make the Web more TV-like, using the example of an online serial he produced for the Microsoft Network (MSN). He states that its failure was due to a lack of guidance and vision of where MSN was heading, and who it was supposed to be serving. "Business, my friends, is what the rest of the entertainment world is about, and they've made it work against similar odds," McCormack says. He concludes that it is the lack of business focus, as well as the intangibles required to make 'good entertainment', that keep new media from succeeding.

Josh Gliddon

■ Editors	Cerise Veblais and Tony Leininger
■ Publisher	Microsoft Press
■ Distributor	Woodslane
■ Phone	(02) 9970 5111
■ Price	\$69.95
■ ISBN	1-57231-917-8
■ Rating	★★★

Marketing in the Cyber Age

The basis of this book is that organisations today need to review their marketing principles and strategies if they are to succeed in the information age. It claims it will show you how to start thinking digitally and move your business into the cyber age. After a quick glance at the back cover and the contents page, you could be fooled into thinking it will provide a hands-on, practical approach, particularly given that author Kurt Rohner has over 15 years' marketing, sales and management experience, mainly in high-tech companies.

In the introduction Rohner talks of the public and market existing digitally in the virtual world, but the focus is very much

in the physical world. As this book has only recently become available in Australia, I was surprised when I found myself reading a section on fax capture combined with databases, which marvelled at how publishing houses can offer book reviews and descriptions by fax, and buyers can fax or post back their order. The book was originally published in German in 1996, and it was translated into English in 1998. You can assume the original was written in 1995, making the content at least three to four years old. You don't need me to tell you that in this industry, whole revolutions can take place in that time.

This explained why there was a case study of a company using computer-based training dating back to 1993, and an example in 1994 of IBM publishing its management report on CD-ROM. The mention of intranets was nowhere in sight. It also explained why the potential of the Internet and the economic realities are addressed as opportunities "in the near future".

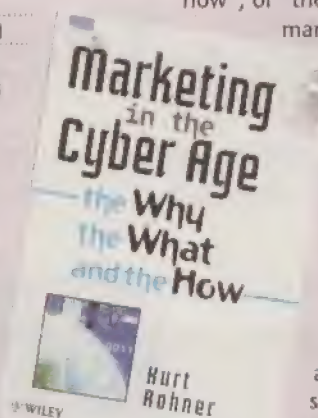
The flow of the book is rather disjointed, and it includes complete sections that seemed totally out of context, such as the chapter in the final section (which is supposedly on "the how", or "the practice" of cyber marketing) on controlling

software development projects.

If there is a positive side, *Marketing in the Cyber Age* is an interesting reflection on the radical changes to marketing opportunities we have witnessed over such a short period of time. And granted, three or four years ago it would have been considered a unique insight into the limitless possibilities promised by the information age. It may have earned three

stars. However, today's savvy marketers can invest more wisely.

Cathie Kennedy



■ Author	Kurt Rohner
■ Publisher	John Wiley & Sons
■ Distributor	Jacaranda Wiley
■ Phone	(02) 9805 1100
■ Price	\$69.95
■ ISBN	0-471-97023-9
■ Rating	★★★

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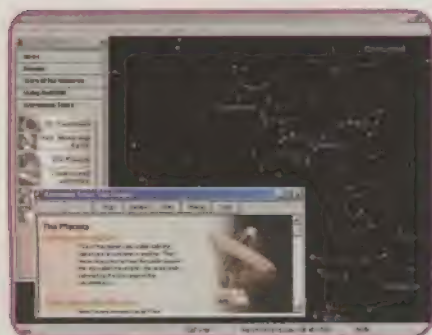
Although I'm not a great fan of astronomy, this CD certainly had me riveted to the screen for quite a while. Using a straightforward click-and-jump metaphor, the program allows you to set up the night sky in any time, place and direction you choose, and then conveniently speeds up time so you can watch the constellations, planets and other heavenly bodies as they move or cross the heavens.

The program is an engaging mix of the visual appeal of the night sky, combined with more technical latitudes, longitudes, elevations, time shifts and orbital trajectories. Most of the choices you make are of the simple 'night sky, Australia, December 1998, looking east' kind, but the more you dig, the more complexity the program can reveal. Alternatively, you can take one of the animated sequence tours, ranging from Apollo 13's approach to the moon, to Genghis Khan's big fright and subsequent retreat thanks to a solar eclipse.

The only problem with the quality of the tours and introductions is that it leads you to expect the same high standard throughout, and when you don't get a full narrative explaining the Russian achievement of landing Venera 7 on Venus in 1970, you get quite piqued. At least I did.

The program contains plenty of hotlinks, and can be run in conjunction with the Penguin Dictionary of Astronomy. There are also plenty of high-quality photos to show what the moons of Saturn look like close up. Intriguing and easy to use, RedShift 3 is a treat for astronomers and plain old stargazers alike.

Jeremy Torr



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■ Phone	(02) 9552 8700
■ Price	\$74.95
■ Requires	Pentium 100, Windows 95, 16M RAM, 4x CD-ROM drive, 11M hard disk space, SVGA
■ Rating	★★★

The Complete National Geographic

Remember flipping through *National Geographic* magazines? The ultimate coffee-table accessories, they have been with many of us since we were in primary school, desperately seeking articles and photographs for school projects.

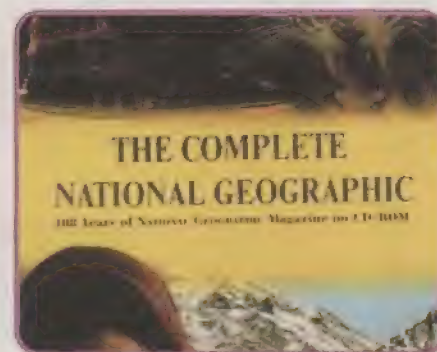
In keeping with technological advances, all 109 years of *National Geographic* are now offered on CD-ROM. Beautifully presented in a wooden, velvet-lined timber box, the CDs are boxed and colour-coded by decade — 10 in all.

Installation is fairly painless, though be warned, read the instructions carefully — unless you begin with a CD from the first decade you'll have to repeat installation and registration for every other decade.

Every print issue, from Volume 1 in 1888 until December 1997, has been scanned as a double-page spread. This allows you to gape at the ways advertisements have changed in the past hundred years, but one drawback of the presentation is that text and graphics often appear fuzzy. A zoom feature generally overcomes this for onscreen reading.

Gone are the days of flipping through countless issues searching for a topic; this collection comes complete with a search function. Input a topic such as 'diving' and the engine retrieves every article on diving published in *National Geographic* since 1888. You then choose an article, pop in the appropriate disc and there it is!

One big drawback with the search engine is that the search is limited to keywords in article titles, rather than article contents. You can supplement information through direct links to the national-geographic.com Web site, which increases its worth as a resource tool and is great for browsing.



This CD set offers a nostalgic record of the changing face of print media and advertising over 109 years. Generally, it is an excellent program that will appeal to a wide variety of age groups. Even better, you can keep adding to it every year as the latest CD-ROM in the collection is released.

Narelle Jordan

■ Publisher	National Geographic Society
■ Distributor	Scholastic New Media
■ Phone	(02) 4328 3555
■ Price	\$299
■ Requires	486/33, Windows 3.1, 8M RAM, 2x CD-ROM drive, 10M hard disk space, 256 colours
■ Rating	★★★★

Blinky Bill and the Magician

Dorothy Wall's lovable character is back in a new adventure, Blinky Bill and the Magician. Once again, it combines a storybook with some educational content and access to the Blinky Bill Web site, and is sure to prove a winner.

The 12-page story (based on an episode from Yoram Gross' television series) sees Blinky and his friends triumph over the troublesome dingo gang. There are two modes: read (it to me) or (let me) play. The words can be made to light up after the first time the story is read, so children can follow along. Individual words can be highlighted and pages can be selected from a master grid. Navigation is easy once you get used to the page-turning hand.

The Maze Game contains two levels, straightforward enough in the easy option but more challenging in the hard option.

Interactive News

● A connected-home revolution has been the subject of much speculation over the past few years, but the myth is now nearing reality. Eight consumer-electronics manufacturers have agreed to begin designing and manufacturing interconnected audio and video components. Led by Philips, the group includes Grundig, Hitachi, Matsushita, Sharp, Sony, Thomson Multimedia and Toshiba. A joint patent licence application for the Home Audio/Video interoperability (HAVi) specification has been lodged. HAVi employs the FireWire digital interface (IEEE 1394) and Java for interconnectivity between PCs, TVs, stereos and VCRs.

● Thanks to the anti-piracy features, such as data encryption, employed in DVDs, piracy levels are low and should remain so. However, piracy of a sort is escalating, particularly in the Asia-Pacific region, where DVDs encoded with laserdisc movies are being sold. The quality is often poor, but they are becoming more readily available in Australia, especially those from the Taiwanese company, Evervision.

● In the US, the push for the HDTV revolution is in full swing. The recent space shuttle launch, carrying returning astronaut John Glenn, turned into an HDTV publicist's dream event when it was revealed that a "disaster had narrowly

been averted thanks to the quality of the HDTV signal". Soon into the launch, NASA technicians were watching the shuttle on their NTSC monitors and all seemed well. After lift-off, while they were sitting back and congratulating themselves, word came that viewers of the HDTV picture had noticed something was amiss during the take-off. The door covering the housing for the landing parachute of the shuttle had come loose, but the analog NTSC signal was not sharp enough to pick this up, so the techs hadn't noticed. The disaster was small scale, but it does highlight the quality of the HDTV signal.

Gareth Jones

The maze builds onscreen as the child progresses through it, and backtracking is necessary when a dead end is encountered. The Painting Game also has a twist: instead of filling in blocks of colour, children choose colours and patterns, and then with a sweep of the magic wand the picture colours itself.



The Memory Game home page presents many simple puzzles, including counting and addition; recognition of coins, animals and colours; and rhyming and matching games. These are, however, of limited educational value as they don't progress in difficulty. Once correctly answered and rewarded, the child is taken back to the home page, discouraging repeat play.

Blinky Bill and the Magician is well-presented and lots of fun, but it should be viewed as an enhanced storybook rather than as a great educational program.

Catherine Howard

■ Publisher	Forest Interactive
■ Distributor	Roadshow Interactive
■ Phone	(02) 9552 8700
■ Price	\$59.95

■ Requires	486/66, Windows 3.1, 16M RAM, 4x CD-ROM drive, soundcard, 256-colour SVGA card, soundcard. Macintosh compatible
■ Rating	★★★

Typing Tutor '99 Platinum Edition

Typing Tutor has traditionally been a competitively priced and feature-rich learn-to-type package. However, its latest release, Typing Tutor '99 Platinum Edition, sports a \$40 price increase; it now retails at just under \$100. This bumps it well into the premium end of the market.

Typing Tutor is suitable for first-time typists through to advanced levels. Additional exercises and games break the monotony of learning to type by the 'home row' method. You can reward yourself by playing any of three games, or for something a little more genteel, go to the Bookshelf, where you can copy-type passages from best-selling books. Show Time is similar to Bookshelf, with the addition of a short video clip you can play once you have completed the exercise.

A comprehensive choice of reports allows you to monitor your progress in terms of speed and accuracy. You can also view reports by letter and punctuation, number and symbols, by finger and by row.

Typing Tutor is simple to install, taking less than three minutes, including the installation of QuickTime.

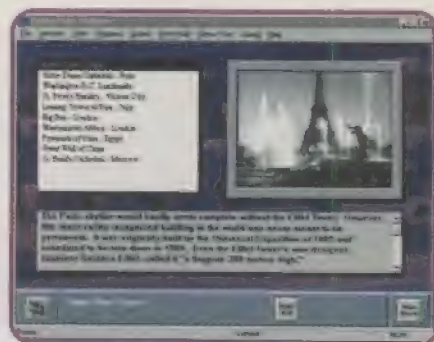
APC could not detect substantial enhancements from the previous version of Typing Tutor, reviewed in July 1997. According to a company spokesperson, the main difference is the Conceptual Effects

Typing Method, which focuses on teaching the whole keyboard in 10 sequential lessons, specific to each finger. The Platinum Edition also comes bundled with complimentary extras including the Webster's Complete Reference Gift Set — dictionary, thesaurus and book of commonly misspelled words — and the CD-ROM 1001 Essential Letters. There would need to be something to justify the 70% price increase!

The only disappointment is that Platinum is the only version available; you cannot purchase the product without the additional bundled goodies for a cheaper price. A shame really, as the previous version's competitive price, coupled with an innovative, simple and entertaining learn-to-type approach, was its main attraction.

Cathie Kennedy

■ Publisher	Simon & Schuster
■ Distributor	Dataflow
■ Phone	(02) 9417 9700
■ Price	\$99.95
■ Requires	486/66, Windows 3.1, 16M RAM, 4x CD-ROM drive, soundcard, 256-colour SVGA
■ Rating	★★★



Lara's back, but if skimpy shirts in the snow are not your scene . . . well, we don't believe you.

Lara does Antarctica

Tomb Raider III: Adventures of Lara Croft

The original Tomb Raider was a landmark game. It was the first to fully demonstrate the power of 3Dfx graphics, and its heroine — the pixellated dream-girl of many a male teenage gamer. It also played pretty well, with clever puzzles, beautifully designed levels, and an impressively dexterous main character.

Adventures of Lara Croft is the third chapter in the Tomb Raider series, and it is highly recommended for fans of the earlier games. The plot — not unlike Croft's costume — is skimpy, and is based on the retrieval of four mysterious artefacts manufactured from the remains of an ancient meteorite. In her quest, Lara travels to the jungles of India, then to London, the South Pacific and Nevada, before her final showdown in Antarctica. In a break from the previous Tomb Raider games, the middle three locations can be completed in any order, which adds a pleasant non-linearity to the story.

The levels again look great, the locales are exotic, and our heroine is just as athletic as ever. She also has a few new moves in her repertoire (crawling and sprinting) and gets to play with some new vehicles, including a boat, a kayak, and — most fun of all — an all-terrain quad bike. The graphics effects have also been spruced up, and a few new weapons have been added.

None of these are major additions, however, and the feel is more of an expansion pack than a revolutionary upgrade. The game engine is beginning to show its age as well, and some of the problems that were evident in the origi-

nal haven't been fixed. Clipping remains a problem. Lara's head is occasionally buried in low ceilings, for example. And although this is primarily a puzzle-solving action game, the addition of a multi-player option is perhaps overdue.

Eidos has clearly taken the 'if it ain't broke, don't fix it' approach with this sequel. Whether gamers will be enticed by another romp with Lara, or choose one of the other, more innovative action games remains to be seen.

Jon Gill

■ Distributor	Sega Ozisoft
■ Phone	(02) 9317 0000
■ Online	http://www.tombraider.com/
■ Price	\$79.95
■ Requires	Pentium 200, Windows 95, 32M RAM, DirectX 6.0, 4x CD-ROM drive
■ Classification	M 15+
■ Rating	★★★

European Air War

In 1993 my second-favourite game (after Ultima Underworld) was Secret Weapons of the Luftwaffe, a classic World War II flight sim with fast dogfights. Despite the EGA graphics and tinny sound, it simply oozed atmosphere.

Here we are in the days of 3D-accelerated visuals and surround sound, but game designers still dream of tearing around the skies in a Spitfire, shouting 'tally-ho, bandits at 12 o'clock high'. Microprose achieved a great deal several years ago with Pacific Air War and this sequel, set around the Battle of Britain and later battles, features an up-to-date game engine, prettier graphics and vast numbers of aeroplanes duking it out in the skies at once.

There are some instant action options, but the heart of the game is your career as a young pilot for Germany, Britain or the US. Any number of squadrons, dates and career durations can be chosen from, and there's a reasonable variety of missions (patrols, escorts, long journeys and scrambles to protect your own airfield). There's also a multiplayer option where co-operation is more rewarding than deathmatch/dogfights.



The level of realism is such that sometimes you're unnecessarily scrambled. But when the skies are full of Luftwaffe bombers and the only thing between them and London is you and your wingmen, there's a huge thrill in sending a few kills into the Channel, trailing smoke and parachutes, then nursing your own machine homeward. The game engine is superb, the level of ground detail is amazing, and realism settings can be adjusted to create either an action game or a full-on simulation.

Unfortunately, the introduction is lame. Set-up screens are ugly, each mission briefing is pretty much the same, and the pilots' quarters — where you can hang out between sorties — are just plain boring. But you can always take a leave pass and check out the game's video archives, which include historical footage with voiceovers, statistics on planes, and close-ups of 3D models used in the game.

But surely it's possible to do more with such a classy game engine? For instance, there are people running around on the tarmac when you land, so it might have been interesting to let the player watch such activity between missions, or create cut-scenes that showed something happening outside. So much more atmosphere could have been injected into what is nonetheless a fine game.

Simon Vandore

■ Distributor	Microprose
■ Phone	(02) 9953 8788
■ Online	http://www.microprose.com/gamesdesign/eaw/
■ Price	\$89.95
■ Requires	Pentium 166 or Pentium I 33



(with 3D accelerator), Windows
95, 32M RAM, 4x CD-ROM drive

■ **Classification** G 8+
■ **Rating** ★★★

Lords of Magic: Special Edition

This is the latest in the Lords family of games from Sierra, so if you've played Lords of the Realm, you'll know what to expect. Lords of Magic is a combination of turn-based strategy and RPG-style character development. As per Lords of the Realm, there is a top-down view of the map from which you move your armies and manage your resources, switching during skirmishes to a top-down view of the battlefield where you can give orders to individual units and watch the battle play out.

What's different about Lords of Magic is a number of very nice features. Immediately noticeable is the 3D map, complete with everything from snow-capped mountains to oceans. There is also the choice of eight different 'faiths' loosely based on the elements, so if you choose the 'water' faith, for example, you'll have advantages with boats, but be instantly at war with the 'fire' faith. And then there is the character development which means your armies become tougher with experience, and your heroes get to find and wield some impressive magical artefacts.

The Special Edition is basically the same as the original, but includes some amazing background music, better AI, five extra campaigns, a map editor, and some extra units and buildings. It also comes with a \$20 rebate for owners of the original Lords of Magic — Sierra's way of apologising for all the bugs in the original (and there were lots) that they've now fixed.

There are a few aspects of the game that could have been done better. The interface feels clumsy compared with other games in the genre, such as Warlords III. And the maps all come in one size — huge — so there is no such thing as a quick game. But apart from that, it's quite

enjoyable. If you're a fan of turn-based strategy games, you'll enjoy Lords of Magic: Special Edition.

Stewart Wicks

■ **Distributor** Wolf Interactive
■ **Phone** (02) 9417 9600
■ **Online** <http://www.lordsofmagic.com/>
■ **Price** \$79.95
■ **Requires** Pentium 100, Windows 95, 16M RAM, 4x CD-ROM drive
■ **Classification** G
■ **Rating** ★★★

NBA Live 99

It took a lot longer than necessary, but thank God the 98/99 NBA season is finally under way. As this drastically reduced season unfolds, you can simulate all the action with NBA Live 99.

This latest instalment of EA Sport's basketball game contains high-flying new dunks and authentic player moves. Real NBA stats, the look and feel of every stadium and the modelled heads of each player add to the total NBA experience. Making the right combination of moves may result in an awesome dunk, with instant replays providing immediate fulfilment, not to mention the opportunity to gloat in front of your opposition.

Commentary is always an important part of any sports title, and the commentators on NBA Live 99 are very entertaining. Play-by-play commentary adds to both the realism and excitement, while colourful comments and personal opinions provide further entertainment.

Exhibition games can be played, or full seasons can be undertaken. There is a consecutive seasons mode, which involves some dedication to play but the rewards are worth it. In this mode, players can even evolve from one season to another, and teams that were a walk in the park the first time you played them can improve. The arcade mode is ideal if you want to get on the court in an instant. This mode has a faster setup, there are fewer rules and it is generally easier to play.

All in all, NBA Live 99 is a solid game. It is disappointing that it took so long for the NBA dispute to be settled, and it would be a shame if the delayed season adversely affects the popularity of this game.

Kieran McNamee

■ **Distributor** Electronic Arts
■ **Phone** (02) 9955 7744
■ **Online** <http://www.easports.com/>
■ **Price** \$69.95



■ **Requires** Pentium 200, Windows 95, 32M RAM, 8x CD-ROM drive, 3D graphics card
■ **Classification** G
■ **Rating** ★★★★★

Thief: The Dark Project

Looking Glass Studios is quickly making a name for itself as a designer of innovative games. Its latest, Thief: The Dark Project, continues its record of excellence, adding a fine twist to the first-person shooter (FPS) phenomenon.

Rather than delivering yet another game with a rocket launcher, Thief asks you to play a thief in a quasi-medieval milieu. And instead of reducing your opponents to so much gibbage, your task is to hide in the shadows and sneak around great mansions and ancient ruins to finish your quests. I know, it doesn't sound very exciting, but it actually provides far more heart-pounding excitement than many other recent FPS games.

It's not the technology that is so striking — in that regard, it lags behind many other recent titles — but the atmosphere. There's nothing quite like waiting in a shadowy corner, hoping the guard patrolling the halls turns his back on you so you can backstab or club him unconscious and then hide his body in a dark recess so the other guards don't notice his absence.

Apart from your sword and club, you're armed with a bow and a variety of useful arrows — from water arrows to put out those revealing torches, to arrows which spread moss on the floor to deaden the sound of your footfall.

You play Garrett, a master thief and former student of the Keepers, a secret organisation with mysterious aims. Your profession has put you in contact with strange underworld figures, and when you're hired to steal an evil artefact, things start to get interesting. The cut scenes, which propel the plot between levels, are excellent, and add to the atmosphere rather than detract from it.



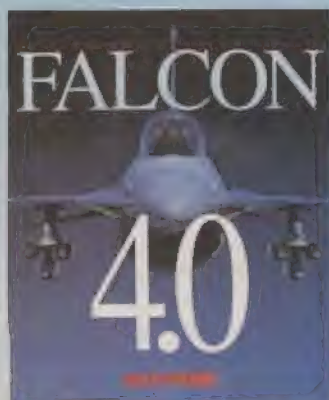
FALCON™ 4.0

"Because of its peristent drive for accuracy Falcon 4.0 provides a closer than ever before impression of what it is actually like to fly a modern jetfighter."

- PC Gaming World

'To say that I was **impressed** would be a gross understatement...what I played was **clearly the best modern flight simulation ever made PERIOD!** MicroProse made a huge commitment to offering us the best flight sim we have ever seen and... Falcon 4.0 is going to wipe the floor with awards.'

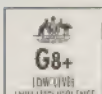
- Bubba Wolford combatsim.com



This is the new benchmark in flight simulation technology. Pilot-tested for accuracy, **Falcon 4.0** models the Block 50/52 F-16C; the most versatile and unrivalled production fighter in existence. Master the F-16C using numerous training missions that range from the 'basics of flight' to 'advanced dogfighting' and combat over the Korean peninsula in real-time dynamic campaigns.

Falcon 4.0™ The World's Finest Flight Simulation.

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CD-ROM

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That's not to say it is without fault. Some levels, such as those with zombies, are more of an exercise in dodging and running than skulking around in the shadows. Game reload times are poor, especially for a title like this where a single misstep might force you to reload your last game. Despite this, it's a great game. It is worth getting if you're after something a little different.

Nathan Taylor

■ Distributor	Sega Ozisoft
■ Phone	(02) 9317 0000
■ Online	http://www.eidosinteractive.com/
■ Price	\$89.95
■ Requires	Pentium 166 (with 3D accelerator), Windows 95, 32M RAM, CD-ROM drive, DirectX 6.0
■ Classification	M 15+
■ Rating	★★★★

Ultima Online — The Second Age

The original Ultima series is renowned for its depth of gameplay and large interactive worlds. For many years, players dreamed of a world populated not by NPCs, but by real people. Last year Origin made the dream a reality when it released Ultima Online (UO), and now the first expansion pack, The Second Age, has made its debut.

The Second Age is essentially a bug-fix release of the original Ultima Online, with an extra 'world' included for players to explore. New lands, new monsters and new adventures are all available to those players who have purchased and installed The Second Age. You don't need the original game to play, however, so if you've been thinking of trying out UO, The Second Age comes with 30 days' free gameplay, after which you need to purchase time to continue playing.

The question is, do you really want to play? Despite the enormous amount of time and money Origin has invested in

getting UO on its feet, the UO servers, mostly located in the US, are physically too far away to allow good gameplay here in Australia. The time it takes for information to travel across the world and back creates 'lag' so bad that most Australian players were quickly put off the game when it first appeared. Over a year later, nothing has changed, despite hundreds (or is it thousands?) of Australian players lobbying Origin for an Australian server to be established.

Apparently, Origin will base its decision about an Australian server on how well The Second Age sells. Sorry, Origin, it doesn't work that way. If an Australian server is set up, you can bet Australian gamers would flock to UO, but without one, it's simply not worth the money — for both the initial purchase and the ongoing playing costs. You'd think the massive sales of UO would be motivation enough.

The Second Age — as a UO fix pack and with bonus lands to explore — would be heartily recommended by this adventurer if the gameplay was anything better than adventure-by-strobe. But until Ori-



gin sets up a local server, you'd be better off spending your hard-earned cash on a game that actually delivers what it promises.

Stewart Wicks

■ Distributor	Electronic Arts
■ Phone	(02) 9955 7744
■ Online	http://www.ultimaonline.com/
■ Price	\$89.95
■ Requires	Pentium 166, Windows 95, 16M RAM, 4x CD-ROM drive, 2M video card, Internet connection
■ Classification	Unclassified
■ Rating	★★

Games News

● 3Dfx used to be the card to have for gamers. Of course, it wasn't long before other video card chipset manufacturers, especially nVidia, noticed the growing market and decided to hop onto the 3D bandwagon. It shouldn't come as too much of a surprise then to learn that 3Dfx has reassessed the way it does business, and decided to buy out board manufacturer STB Systems. The move has altered the plans for three very important parties: Creative Labs, Diamond Multimedia, and nVidia. From Voodoo3 onwards, Creative and Diamond will no longer be able to buy 3Dfx chipsets for their boards, and nVidia will no longer have access to STB, which used to be one of its biggest clients. Diamond and Creative, however, look ready to step into the breach, with representatives from both companies noting that they will be looking towards nVidia for supply.

● The English seem to have a fairly different value system to us. First it was ex-Spice girl Geri Halliwell becoming a UN ambassador for something or other. That was strange enough, but recently it was proposed that Britain needs to show that it is a forward-thinking and

progressive nation — and how better to show this than to have a fictional character with improbably large breasts as an ambassador for scientific excellence? Yes, Lara Croft of Tomb Raider fame has been proposed as the new scientific ambassador because, says Lord Sainsbury, "we need to show that Britain is the home of modern inventors like Crick, Hawking and Dyson". Yes, quite.

● Ion Storm has been having a hard time of it lately. Its initial release was panned by critics and ignored by the public, and it now seems to be shedding staff at an alarming rate. Latest to leave was a group of 10 staff, who left to form their own company called Bloodshot Entertainment. They've already signed a deal with maverick publishing group G.O.D., and have announced their first project — a game based on the Todd McFarlane comics about the never-say-die rockers KISS. Details are scarce at present, but it looks set to be a first-person shooter with plenty of "raw electric excitement", said KISS bassist Gene Simmons. Mmmm, sounds exciting . . .

Gamespy

*Monsters, spaceships, computers and femme fatales:
the science fiction odyssey.*

50,000 light years from home

Science Fiction Weekly

Did you know that there's a 'Star Trek' MasterCard available in the US? No? Well, that's only one of the tidbits of trivia you can glean by visiting the Science Fiction Weekly Web site . . . and that's just from reading the ads!

Science Fiction Weekly tries to be all things to all sci-fi fans, which is a pretty mammoth task considering the sheer breadth, depth and number of subgenres that make up what's commonly known as science fiction. The site makes a pretty good fist of tackling the task, and features separate areas devoted to classic science fiction, anime, general news, sights and sounds (aka multimedia) and a wonderful gallery of the work of sci-fi visual artists.

What the site doesn't try to do is address the multitude of formats in which science fiction is available, instead sticking primarily (but not solely) to TV and film. And that's OK with us, because TV and film is the way that the majority of sci-fi fans consume new material (and aren't we all so excited about the new Star Wars film coming our way in June!).

This reviewer's main interest, though, is in vintage sci-fi. Vintage stuff seems to reflect a time when science was viewed as a means of liberation and a vehicle for accessing a glorious future. Science was also viewed as a way of ensuring the American way of life was preserved, which is why films such as 'It Came from Outer Space', reviewed in Science Fiction Weekly in January 1999, were thinly veiled allegories about the dangers of communism and the Soviet Union. More

to the point, however, sci-fi reflected the way that people felt about themselves and the world at large. It acted as a dis-intermediator, a way of taking a few steps back and having a look at the way things were through the eyes of the future.

Like all the sites reviewed in Web File this month, Science Fiction Weekly has high production values and is quick to load. Where it differs from the other sites is in its ease of navigation.

More to the point, though, it provides a means for sci-fi fans to keep up-to-date with what's happening in the world of sci-fi. And that's a good thing.

John Klaatu

■ **Online** <http://www.scifi.com/stfw/current/index.html>
 ■ **Rating** ★★★★★

The Fifth Dimension

"There is a fifth dimension beyond that which is known to man. It is a dimension as vast as space and timeless as infinity. It is the middle ground between light and shadow, between science and superstition, and it lies between the pit of man's fears and the summit of his knowledge. This is the dimension of imagination. It is an area which we call the Twilight Zone."

So began the first episode of the first season of 'The Twilight Zone'. The better-known, and longer-running sibling of 'The Outer Limits', 'The Twilight Zone' was the brainchild of Rod Serling, a radio scriptwriter who turned his hand to TV drama in the early 1950s. 'The Twilight Zone' made its debut in 1959, running for five seasons before being cancelled due to lack of network interest.

The Fifth Dimension is part of a 'Twilight Zone' Webring. We didn't spend much time checking out the rest of the sites in the ring, but if Fifth Dimension is any indication of quality, then the associated sites and ring would be of a very high standard overall.

Some sites are nice introductions for



newbies; The Outer Limits site reviewed over the page not is a prime example of one of those. The Fifth Dimension is different, however, in that it's one of those rare sites that render a paper-based companion to the series (and there are a few out there) virtually irrelevant.

It's one that's obviously aimed at old fans, people who are familiar with the episodes, characters and plotlines. Despite this assumed familiarity, there's a comprehensive FAQ, a Rod Serling bio, episode guides for each season, multimedia clips and more. Polls, surveys and a mailing list are also available.

Overall production values are high, but again, the design is somewhat confusing unless you're already familiar with 'The Twilight Zone'. Prime examples are the listing of names on the intro page (who are they? what do they mean?), the right-hand frame set which is

far longer than any frameset has any right to be, and the weird artwork.

One aspect that's missing from this site is the personality of the owner. Most fan sites are created because of someone's special relationship with a show, band, person or thing. Here, there's no explanation of why the person likes the show, who they are, or when they became enamoured with 'The Twilight Zone'. That aside, this site is almost unsurpassed in its comprehensive coverage of the show.

Josh Gliddon

■ **Online** <http://www.the5thdimension.com/>
 ■ **Rating** ★★★★★



The Outer Limits

Memory One: My father telling me about his days as a PMG trainee in the 1960s, watching 'The Outer Limits' on the night shift and having to make double sure that all the windows and doors were locked afterwards.

Memory Two: Me, as a 10-year-old, hiding behind the seats at a special Trekkie-convention cinema showing of old 'Outer Limits' episodes.

The 'Outer Limits' is somewhat like a seminal 1960s rock band that no-one's really heard, but which had a dramatic influence on its successors. It also exists somewhat in the shadow of its younger sibling, 'The Twilight Zone'. Both mined the same type of science fiction/horror vein, and both are unique in that nothing has been produced for television that approaches the level of creativity of either show since.

This site is a perfect introduction for 'Outer Limits' newbies. It has a neat opening screen that mimics the show's opening titles — "There is nothing wrong with your television set. Do not attempt to adjust the picture. We are controlling transmission. If we wish to make it louder, we will bring up the volume. If we wish to make it softer, we will tune it to a whisper" — without being too bandwidth-intensive. Visitors with low-bandwidth connections, or those that don't like Macromedia's Shockwave, however, may want to skip the intro altogether, and head straight for the single-page history section.

The lack of plagiarism exhibited is admirable: too often, fan pages seem to be built primarily on the (ripped-off) work of others. This site makes references to other sites, such as a more comprehensive history site, and provides links. More importantly, it has an episode guide with links to the Internet Movie Database (IMDb) for each of the actors, in addition to a short description of the plot, and footnotes by a fan who's obviously watched each and every episode too many times.



Surfbaud: From Earth to the Moon

As a literary genre, science fiction is as much a moving target as free jazz is with respect to modern music — meaning it's extremely difficult to nail down the essence of sci-fi into a neat three-line definition.

The reason for this is that sci-fi's basic premise, the interaction between humans and technology, allows massive scope for improvisation and originality. In spite of this, sci-fi's always struggled for legitimacy and recognition as 'literature' rather than just popular culture.

The struggle between pop and literature can be traced back to Jules Verne, the man generally acknowledged as the father of science fiction. In the 19th century it was common for novels to be released as serials in the popular press before subsequent release as a hard-bound novel. According to Scientific American (see link), Verne's stories were massively popular when serialised in the French periodicals available at the time.

The reason for their popularity is twofold: first, there was very little scientific education provided in French schools because of the control exerted by the Roman Catholic Church. The second reason was the rapid industrialisation and increasing rate of scientific discovery at the time.

Verne's novels were also successful for another, more prosaic reason: they were rollicking good adventure yarns that took readers to far away places in impossible machines.

The period in which Verne was writing (he died in 1905) was also the time that a new way of telling fantastic stories — film — was undergoing rapid development. It's therefore no surprise that 'From Earth to the Moon', one of Verne's most popular stories, was filmed by Georges Méliès in 1902 as 'Le Voyage dans la Lune'

('Voyage to the Moon' — see link).

Much of Verne's early work is scientifically optimistic, featuring stories and plot-lines predicting scenarios where humans are assisted towards a better future by machines. It wasn't until later in his writing career that Verne began to meditate upon the downside of human interaction with technology. Unfortunately for Verne, these later novels weren't as successful as the early, optimistic stories. Not that this bothered Verne — he had already made his fortune.

Early film, however, didn't avoid technology's dark underbelly. Most notable was Fritz Lang's phenomenally famous 'Metropolis'. This film depicts a leisured class of people living in a futuristic city. Their lifestyles are supported by a vast underclass of workers that live and toil in the depths of the city. The story is both a romance and a meditation on the duality of humankind's relationship to technology and science. It's also a film that's extremely difficult to get a handle on because it exists in so many different forms; restored, unrestored, restored with missing scenes and so on.

Verne's and Lang's works are the foundations of modern sci-fi. Any fan of Iain M Bank's sentient machine visions, William Gibson's cyberspace constructions or Bruce Sterling's work owes it to themselves to go back and make a thorough assessment of these early visionaries.

Josh Gliddon

Scientific American: Jules Verne

<http://www.sciam.com/0497issue/0497evans.html>

Le Voyage dans la lune [http://us.imdb.com/Title?Voyage+dans+la+lune,+Le+\(1902\)](http://us.imdb.com/Title?Voyage+dans+la+lune,+Le+(1902))

Metropolis <http://www.paulist.org/doug/metro/default.ssi>



There's also a sounds and images section and, more importantly, a list of companies that are able to supply 'Outer Limits' episodes on laserdisc (NTSC format, unfortunately) or VHS videotape. As all the suppliers listed are US and UK-based, however, it's unclear whether the episodes are available in Australia.

Either way, mail order is possible, and that's welcome news for those of us who

were under the impression that 'Outer Limits' episodes simply weren't available. Indeed, rumour had it that many of the original episodes were destroyed by the production company. My cheque's just gone into the mail.

Josh Gliddon

■ Online <http://www.subnet.co.uk/brendan/outerlimits.html>

■ Rating ★★★

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*We were walking in the park one day, in the merry, merry month of May . . .
Oh, sorry, it's the March issue, isn't it?*

Chip Chat

The spirit of stupidity

By now, you've likely heard the story of how a group of evil programmers afforded themselves some momentary amusement by adding footage from the deservedly popular adult cartoon 'South Park' to a games package. In case you didn't, it goes like this: a group of evil (or more likely bored) programmers decided to include the 'South Park' short 'The Spirit of Christmas' on a PlayStation game, Tiger Woods 99 PGA Tour Golf, from Electronic Arts. The film (which is very funny, by the way) can't be viewed on the PlayStation, but can be accessed if the CD is used on a PC, thanks to the evil programmers.

As a result, Electronic Arts, which developed the game, has recalled all 100,000 copies of the game from the US market, saying that "the unauthorized material is objectionable to consumers, Electronic Arts and all parties associated with the product". Now, not only does Chip Chat disagree, but we have to wonder why anyone would return the CD when it's bound to be a collector's item someday. However, local users are unlikely to get that opportunity; the local release was scheduled for some months after the US and the problem was discovered 'in time', as they say.

Spray and wipe

This just in from the So-stupid-it-might-even-catch-on department: a Victorian firm is selling a new product known as the Millennium Bug Repellent, a \$9.95 spray can which does nothing apart from, well, spray stuff. The promotional literature proclaims that it's the "ideal present for the computer nerd in your family". We personally recommend the *Linux Pocket-book* (\$14.95, and it actually does something), but then of course we're biased.

Porn to be wild

It turns out that an awful lot of APC readers want nothing more than to while away the hours running their own adult Web sites. Since we ran a feature on how one Australian was making thousands of dollars a week running a family of (and

there's no delicate way to say this) porn-promoting Web presences, the phones have not stopped ringing, the fax machine has been on overload and the emails have not stopped flooding in from people keen to learn more about how to enter this mildly dubious line of work. It's very pleasing to know that the entrepreneurial spirit (codename: Project Naked Greed) is alive and well.

Hot stuff for Intel

Everyone knows that one of the technology problems Intel constantly faces is making sure that its processors don't get all overheated. What you may not have

known is that the problem is rather more extensive than was first thought. When one APC staffer called Intel recently with a question, he was told that no-one was available to assist him because the office air-conditioning had broken down and everyone had been sent home.

Technology tips: Mail merge in Word

The following is a verbatim quote from a letter sent by Microsoft to technology journalists across the country recently: "We'd appreciate it if you could assist us in this process by emailing the list of names to Error! Reference source not found."■

Contest: Technology gag of the month

The holiday break brought a frenzy of new jokes from people eager for a moment's glory in Chip Chat. Selecting the best proved a surprisingly difficult task (even if people are still ignoring our entreaties to stop with the Bill jokes already), but in the end there can be only one winner. And this month, that winner is Stephen Laheney, who gets extra bonus points for going to the trouble of localising the joke:



Three men, a project manager, a software engineer, and a hardware engineer are on the Sunshine Coast for a two-week period helping out on a project. About midweek, they decide to walk up and down the beach during their lunch hour. Halfway up the beach, they stumble upon a lamp. As they rub the lamp, a genie appears and says "Normally I would grant you three wishes, but since there are three of you, I will grant you one wish each."

The hardware engineer goes first. "I would like to spend the rest of my life living in a huge house on Sydney Harbour, with no money worries and

surrounded by beautiful women who worship me." The genie granted him his wish and sent him off to Sydney Harbour.

The software engineer went next. "I would like to spend the rest of my life living on a huge yacht cruising the Whitsundays, with no money worries and surrounded by beautiful women who worship me." The genie granted him his wish and sent him off to the Whitsundays.

Last, but not least, it was the project manager's turn. "And what would your wish be?" asked the genie. "I want them both back after lunch," replied the project manager.

We'll be sending Stephen a Windows 98 Plus! Pack and a Novell T-shirt, courtesy of Microsoft and Novell and because it appeals to our mordant sense of irony. Fancy one of these more-impressive-than-it-sounds prizes? Send your technology jokes — the shorter and funnier the better — to chipchat@acp.com.au. If we publish your joke, you'll win a specially selected item from the APC prize cupboard.

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